The Northwestern MILLER
MILLING PRODUCTION SECTION

Stability Studies of Self-Rising Flour At the Market Place

By R. D. HAYNES

Self-rising flour is largely beyond the miller's control once it leaves the mill . . . yet its quality continues to be of high concern to his milling operations until the last cupful is used by the housewife . . .

THERE is no need to point out the merits of self-rising flour to you because of your full knowledge of the benefits pertaining to its sale and use. Also, I know that you as millers are vitally interested in the quality characteristics of the self-rising flour as it leaves the mill and have taken precautions to see that this quality is high.

The excellence of the self-rising flour leaving the mills has been reaffirmed many times by tests conducted in Monsanto's laboratories. The self-rising flour, once it leaves the mill, is to a large extent beyond the miller's control. Yet, his interest in quality continues because maintenance of high quality until the last cup of flour is used by the housewife affects the continued sale of his product and the ultimate profitability of his milling operations.

The question often should be asked: What is the quality of flour found in the stores, at the point of sale, and what can be done to further improve it? It is with these questions that this report is concerned.

Test Procedure

To determine quality at point of sale during the hot humid months of August and September, self-rising flours were picked up in grocery stores throughout the Southeast and in one large midwestern city. The sacks of flour were mostly five pounds in size. The stores were selected at random and all brands of flour found at the time were sampled. Flours were forwarded to our laboratories in St. Louis where they were immediately tested for moisture and for level of soda.

The flours were then test baked into biscuits using a standard baking procedure. The biscuits from each flour were checked for crumb pH, total volume, specific volume, and given an over-all performance rating. Before passing to a discussion of the data, I would like to say that in Monsanto's laboratories we always give considerable attention to the precision of the biscuit baking procedure. All ingredients are carefully weighed, and each operation of mixing, rolling, cutting and baking is standardized and timed.

Only with these careful attentions to details is the baking test meaningful and can comparisons between leavenings and flours be considered accurate. Even so, it is not uncommon to encounter errors as great as .08 in specific volume on duplicate bakings.

Specific volume is determined by dividing the volume of eight baked biscuits by the weight of the same eight biscuits before baking. The higher the specific volume, the lighter is the biscuit. The accompanying table gives an approximate correlation of specific volume with biscuit quality as judged from the standpoint of leavening performance:

Specific Vol.	2.4 and above	2.3-2.39	2.15-2.29	2.0-2.14	2.0 and below
Quality	Excellent	V. Good	Good	Fair	Poor

While specific volume best characterizes leavening performance, a general evaluation of quality includes other factors such as color, taste, total volume and over-all appearance.

The 47 self-rising flours tested were found to vary widely in quality characteristics. This is vividly illustrated in Figure 1, which shows the variability of biscuits baked from six consecutive retail survey samples. It is very interesting to note that these biscuits which varied so widely in size or volume were from flours with comparable levels of sodium bicarbonate.

A summary of the ratings of these flours, based on the quality of biscuits baked from each, is given in Table 1. One-third of the flours ranked from good to excellent, while the remaining two-thirds ranked from fair to poor.

The results in more detail are shown in Table 2, with a summary of averages in Table 3.

Moisture Contents

Moisture contents of the flours varied from 10.9% to 13.6%, with an average of 12.2%. This average corresponds to an approximate relative humidity of 58% at 90° F.

The pH of the biscuit crumb is a good index of leavening balance; i.e., whether the soda and phosphate are in proper proportions to give a neutral product. A biscuit pH falling in the range of 6.8 to 7.2 is considered normal for calcium phosphate leavened flours. Below this range the biscuits are generally too acidic and above too alkaline. From Table 2 it can be seen that 15 flours, or 34%, had crumb pHs outside this range. This does not refer to the three flours that were leavened with sodium acid pyrophosphate, which have a normal pH range of about 7.3% to 7.60%.

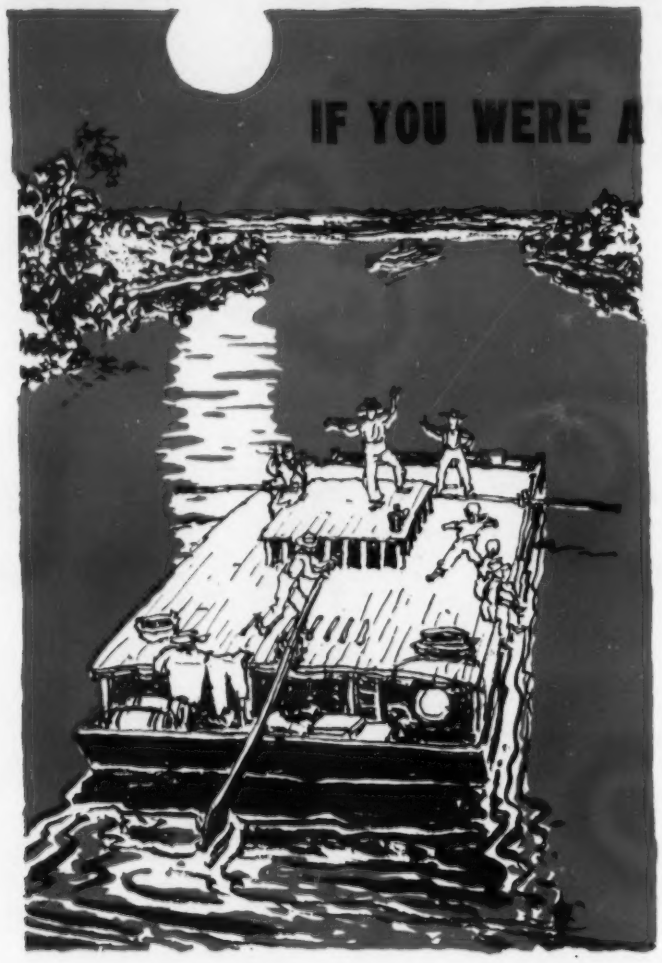
The levels of sodium bicarbonate in the flours varied quite widely, from a low of .85% for samples No. 34 and 39, to a high of 1.37% for No. 35; obviously .85% is much too low and corresponding specific volumes of 1.83 and 1.92 are indicative of poorly leavened biscuits. No. 35, with the highest soda level, gave a specific volume of 2.35, for a rating of "very good."

While extremely low soda levels are frequently associated with poor quality, yet careful study of these data fails to establish a correlation

(Turn to SELF-RISING STUDIES, page 3a)

FIG. 1

EDITOR'S NOTE: Mr. Haynes is with Monsanto Chemical Co. at St. Louis. His paper was presented before the spring meeting of Southeastern District 11, the Association of Operative Millers, held at Roanoke, Va.



IF YOU WERE A MILLER IN 1845

Under Polk as President, Texas was annexed and the Oregon Problem was shortly to be settled.

The country was expanding in every direction and flatboat traffic on the Mississippi river to New Orleans in 1846 amounted to over 2,000 craft, generally manned by rough, tough crews that fought, frolicked and gambled their way through every river town from Cincinnati to New Orleans.

There were, of course, exceptions for it is recorded that Abraham Lincoln, as a young man, made two trips to the southern city, his first experience of the "outside world."

Flatboats carried interesting cargoes—tobacco, pork, grain, whisky, brandy and flour, among other things. They were a valuable means of getting a miller's products to better markets, and millers all along the river tributaries shipped to New Orleans where the prices were high and overseas transportation was available. Much of the flour, we are confident, was bolted through good SWISS SILK, for way back in 1845 it was the miller's favorite, as it is today.

★ ★

SWISS SILK

BODMER
DUFOUR
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SCHINDLER
WYDLER

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SELF-RISING STUDIES

(Continued from page 1a

TABLE 1—Evaluation of Self-Rising Flours in Retail Markets

Marketing area	Number of retail samples tested	AMCP Flours — Per cent of samples rating — Excellent	Very good	Good	Fair	Poor
Georgia	4		25	25	50	
Kentucky	4				75	25
North Carolina	10	30	10	10	20	30
South Carolina	4		25		25	50
Tennessee	5			20	20	60
Texas	6			17		83
Virginia	1				100	
Southeastern area	34	9	9	12	29	41
Chicago	10		10	10	30	30
Total	44	7	9	16	30	38
				SAPP Flours		
Kentucky	2	100				
Tennessee	1	100				
Total	3	100				

between soda level and biscuit specific volume. For instance, four flours, No. 27, 31, 33 and 43, all with soda levels of 1.25%, had specific volumes of 2.59, 1.82, 2.28, and 1.97, and ranged in quality from poor to excellent.

Other tests have shown that biscuit specific volume does correlate with the rate-of-reaction or the stability state of the anhydrous monocalcium phosphate. The explanation lies in the perishable nature of the stabilizer or coating on the anhydrous monocalcium phosphate. In the presence of considerable moisture, as is present in flour stored in warm, humid areas, the coating loses effectiveness, thus permitting the particles of anhydrous monocalcium phosphate to begin picking up water and hydrating to the familiar monohydrate form.

This partially or wholly hydrated form of phosphate is faster in its reaction with the soda and reduces specific volume of the biscuits proportionately.

With sodium acid pyrophosphate as the leavening acid, it has been shown that a correlation does exist between the soda level and specific volume, both initially and after prolonged storage of the flours. This is due to the slow rate-of-reaction of SAPP and its inherently good stability even in the presence of relatively high moisture levels in the flour. This good stability which enables only moderate levels of soda to give high biscuit specific volumes is well illustrated by flours No. 18 and 47. These flours had soda levels of 1.15 and 1.10% with excellent specific volumes of 2.50 and 2.44.

The results of these tests on the quality of self-rising flours in retail stores during the summer and fall months indicate that the mills can and should take steps to further improve the self-rising qualities of their flours. The following steps are recommended for consideration:

TABLE 3—Summary of Test Results Showing Quality of 47 Self-Rising Flours Purchased in Retail Markets

	Per cent flour moisture	Per cent soda (total basis)	Biscuit crumb pH	Specific volume
Avg. for AMCP samples from air-cond store	12.2	1.18	6.90	2.08
Avg. for AMCP samples from nonair-cond. store	11.9	1.11	6.82	1.92
Avg. for all AMCP leavened samples	12.1	1.16	6.88	2.04
Avg. for three SAPP-28 leavened samples	12.5	1.12	7.32	2.47
Avg. for all retail survey samples	12.2	1.15	6.92	2.06

TABLE 2—Detailed Test Results Showing Quality of 47 Self-Rising Flours Purchased in Retail Markets

Sample No.	State & county	Date received	Store air cond.	Per cent flour moisture	Per cent soda (total basis)	Biscuit crumb pH	Specific volume
1	Georgia—Fulton	Aug. 21, 1958	Yes	12.8	1.16	6.90	2.17
2	Georgia—Fulton	Aug. 21, 1958	Yes	12.0	1.19	6.82	2.16
3	Georgia—Fulton	Aug. 21, 1958	Yes	12.9	1.12	7.11	2.39
4	Georgia—Fulton	Aug. 21, 1958	Yes	12.4	1.20	7.40	2.09
	AVERAGE			12.5	1.17	7.06	2.20
5	Texas—Bexarfield	Sept. 3, 1958	Yes	12.2	1.17	6.90	1.82
23	Texas—Nacogdoches	Sept. 30, 1958	Yes	11.9	1.15	6.83	1.95
24	Texas—Nacogdoches	Sept. 30, 1958	Yes	12.7	1.04	6.83	1.80
26	Texas—Nacogdoches	Sept. 30, 1958	Yes	12.4	1.17	6.92	1.91
	AVERAGE			12.3	1.13	6.87	1.87
6	Texas—Nueces	Sept. 3, 1958	No	12.0	1.08	6.72	1.91
25	Texas—Marion	Sept. 30, 1958	No	12.3	1.11	7.00	2.15
	AVERAGE			12.2	1.10	6.86	2.03
8	Illinois—Cook	Sept. 8, 1958	Yes	12.7	1.25	6.53	2.30
9	Illinois—Cook	Sept. 8, 1958	Yes	12.5	1.16	6.70	2.15
11	Illinois—Cook	Sept. 8, 1958	Yes	13.1	1.10	6.90	2.26
12	Illinois—Cook	Sept. 8, 1958	Yes	12.6	1.12	6.99	1.96
13	Illinois—Cook	Sept. 8, 1958	Yes	12.9	1.18	6.80	1.95
14	Illinois—Cook	Sept. 8, 1958	Yes	11.9	1.21	6.90	2.24
15	Illinois—Cook	Sept. 8, 1958	Yes	11.7	1.22	6.82	2.08
	AVERAGE			12.5	1.19	6.82	2.13
7	Illinois—Cook	Sept. 8, 1958	No	12.9	1.18	6.57	2.19
10	Illinois—Cook	Sept. 8, 1958	No	12.7	1.23	6.97	2.02
16	Illinois—Cook	Sept. 8, 1958	No	12.7	1.11	6.60	1.76
	AVERAGE			12.8	1.17	6.71	1.99
19	Kentucky—Jefferson	Sept. 19, 1958	Yes	12.1	1.10	7.43	2.46*
20	Kentucky—Jefferson	Sept. 19, 1958	Yes	12.0	1.16	6.85	2.02
21	Kentucky—Jefferson	Sept. 19, 1958	Yes	12.5	1.23	6.95	2.08
22	Kentucky—Henderson	Sept. 30, 1958	Yes	11.5	1.19	6.83	2.09
	KY. AIR-COND. AVERAGE*			12.0	1.19	6.88	2.06
17	Kentucky—Jefferson	Sept. 19, 1958	No	12.3	1.01	6.85	1.91
18	Kentucky—Jefferson	Sept. 19, 1958	No	12.6	1.15	7.32	2.50*
27	N. C.—Guilford	Oct. 1, 1958	Yes	12.0	1.25	7.25	2.59
29	N. C.—Guilford	Oct. 1, 1958	Yes	11.9	1.29	7.03	1.86
30	N. C.—Guilford	Oct. 1, 1958	Yes	12.2	1.28	6.80	2.54
31	N. C.—Guilford	Oct. 1, 1958	Yes	12.0	1.24	7.24	1.82
32	N. C.—Guilford	Oct. 1, 1958	Yes	11.3	1.14	7.22	2.04
36	N. C.—Guilford	Oct. 1, 1958	Yes	11.2	1.20	6.90	2.00
37	N. C.—Guilford	Oct. 1, 1958	Yes	10.9	1.17	6.67	1.96
	N. C. AIR-COND. AVERAGE			11.6	1.22	7.02	2.12
28	N. C.—Guilford	Oct. 1, 1958	No	12.1	1.21	6.93	2.49
33	N. C.—Mecklenburg	Oct. 1, 1958	No	11.4	1.24	6.80	2.28
35	N. C.—Iredel	Oct. 1, 1958	No	11.3	1.37	6.87	2.35
	N. C. NONAIR-COND. AVERAGE			11.6	1.27	6.87	2.37
34	S. C.—Horry	Oct. 1, 1958	No	11.2	0.84	7.07	1.83
39	S. C.—Horry	Oct. 1, 1958	No	11.2	0.85	6.87	1.92
	S. C. NONAIR-COND. AVERAGE			11.2	0.85	6.97	1.88
38	S. C.—Horry	Oct. 1, 1958	Yes	10.9	1.29	6.85	2.28
40	S. C.—Horry	Oct. 1, 1958	Yes	10.9	1.00	6.58	2.04
	S. C. AIR-COND. AVERAGE			10.9	1.15	6.72	2.16
41	Virginia—Campbell	Oct. 1, 1958	No	11.0	1.05	6.75	2.07
42	Tennessee—Shelby	Oct. 10, 1958	Yes	13.6	1.03	6.75	1.93
43	Tennessee—Shelby	Oct. 10, 1958	Yes	12.0	1.24	6.80	1.97
44	Tennessee—Shelby	Oct. 10, 1958	Yes	13.3	1.18	6.86	2.02
45	Tennessee—Shelby	Oct. 10, 1958	Yes	13.1	1.17	6.75	2.26
46	Tennessee—Shelby	Oct. 10, 1958	Yes	12.8	1.04	6.75	1.80
47	Tennessee—Shelby	Oct. 10, 1958	Yes	12.7	1.10	7.22	2.44*
	TENN. AIR-COND. AVERAGE*			13.1	1.13	6.78	2.00

*SAPP leavened samples were not included in the state average.

Control (fresh) | A 8 mos. | B 8 mos. | C 8 mos. | D 8 mos. | E 7 mos. | Control (fresh)

Effect of 7-8 months' storage of commercial self-rising flours on quality of biscuits. All flour samples were leavened with conventional stabilized Monocalcium Phosphate and taken from retail stocks in Tennessee.

1. Jobbers', distributors' and retail stocks of flour should be kept at a minimum consistent with good business. This will give faster turnover of stocks and thus shorten the average age of the flour. This is a very necessary precaution during the warm to hot months.

2. Warehousemen and stock-boys should be actively encouraged to rotate flour stocks in order to prevent an accumulation of old flour.

3. The initial moisture level in the flour should be carefully watched during the warmer months, and preferably kept on the low side.

4. The level of sodium bicarbonate added at the mill should be at least 1.30% (basis flour) for soft wheat flours, and 1.40% for hard wheat flours. This is subject to some adjustment depending on various factors as bleaching, hardness, etc.

5. In a number of flours tested, the leavening was not in proper balance. Hence, care should be exercised in plant operations to see that the soda and phosphate are properly weighed into each batch and uniformly blended. Routine checks of leavening balance should be made on each batch of self-rising flour using a good indicator solution or pH meter.

6. If inventory control and stock rotation continues a problem to the detriment of self-rising quality, then it is suggested that the highly stable sodium acid pyrophosphate be considered, particularly during the warmer months.

One Year's Testing of Ventilated Bulk Shipments

By F. W. Hayes
Vice President, Russell-Miller Milling Co.

JUST a year ago, Russell-Miller Milling Co. equipped its first Airslide car with a Filt-R-Aire ventilator in an effort to solve the numerous problems inherent in bulk flour shipments. Everyone in the industry recognized the problems and the need for solution, yet many were skeptical.

Both millers and railroad personnel asked such questions as these: "Why not make an opening in each end of the car with filters and circulate air through the car by the motion in transit? What if the ventilated cars pass through high odor areas? Will ventilation pick up or lose moisture in the lading? How long will a battery keep the fan operating? Why not install a dehumidifier instead?"

After a year's experience with four cars equipped with the Filt-R-Aire, covering the entire eastern half of the U.S., we can now answer these questions and report on the complete results of air-conditioned shipments. These four units have been operating from the Great Lakes region as far south as Texas and east to the coast. These cars have encountered every climatic condition involving humidity and temperature ranges.

Theories Disproved

The milling industry has had many theories about bulk problems that our research has undertaken to prove or disprove. Early and most persistent was the belief that most bulk shipping problems were the result of improper loading and that there were little or no problems arising with bulk ladings during transit.

It is true, many bulk problems are created by our methods of loading; however, many of these are greatly accentuated during transit, and still others occur only in transit.

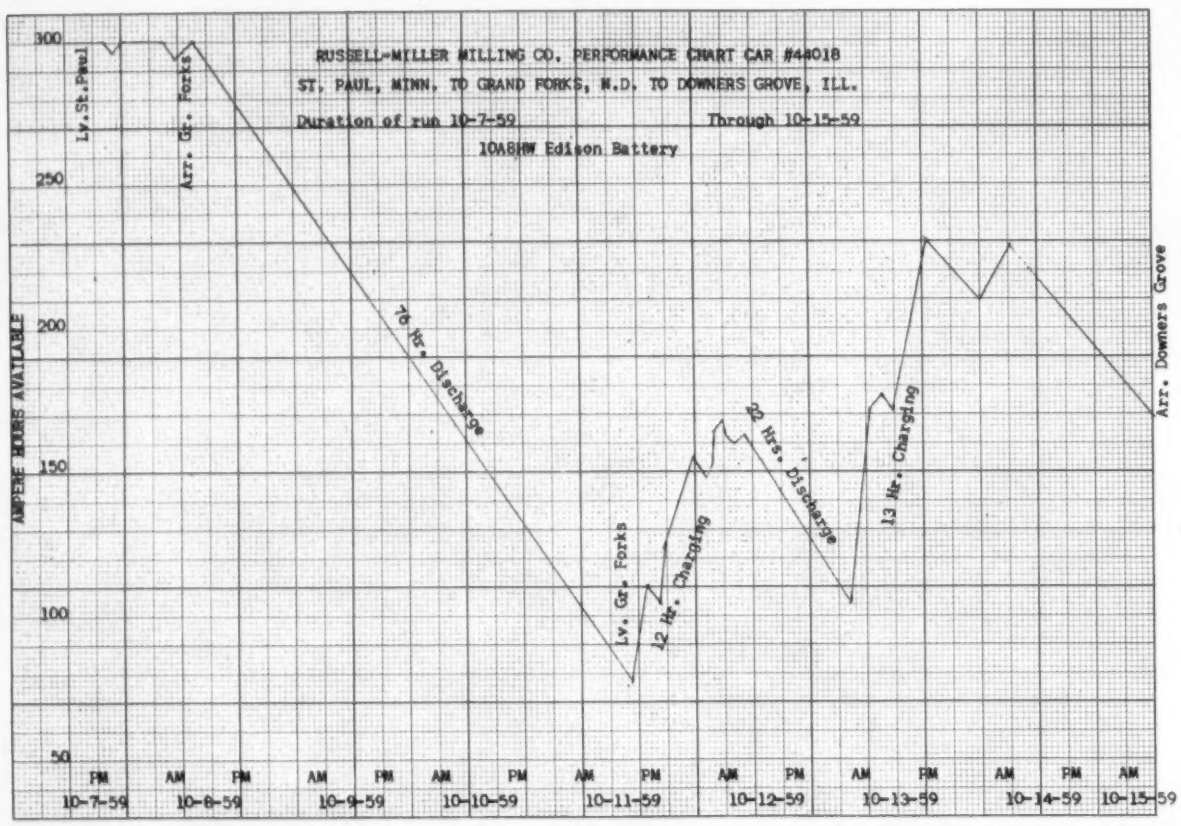
If walls and ceiling of the car are not kept dry during loading, the flour dust settling on these moist areas will cause a caked accumulation which often ferments enroute if the car is not ventilated. Mold develops in transit. When the outside temperature is right, especially during the spring and fall months of the year, the moist, stagnant air entrapped in the top of the bulk cars will produce terrific mold development in just a few days.

The fear of flour picking up foreign odors was also investigated. In our experience with these four cars no odor was ever detected. It is a fact that flour will absorb odors readily from the air, but under laboratory tests it was found that under continued aeration flour will lose odors as readily.

On two trips the fans were turned off, but the ventilator hoods were kept open. The momentum of the train was not sufficient to force the circulation of air through the vents of the car. The warm moist air over the load was apparently heavier than

(Turn to BULK TESTING, page 18A)

CHART I


RUSSELL-MILLER MILLING CO. PERFORMANCE CHART CAR #44018
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Duration of run 10-7-59 Through 10-15-59
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AMPERE HOURS AVAILABLE
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250
200
150
100
50
Lv. St. Paul
Arr. Gr. Forks
76 Hr. Discharge
Lv. Gr. Forks
12 Hr. Charging
22 Hrs. Discharge
13 Hr. Charging
Arr. Downers Grove
PM AM PM AM PM AM PM AM PM AM PM AM PM AM PM AM
10-7-59 10-8-59 10-9-59 10-10-59 10-11-59 10-12-59 10-13-59 10-14-59 10-15-59

Chart of generator input and output to the battery while operating the fan on trip from Grand Forks, N.D., to Downers Grove, Ill.

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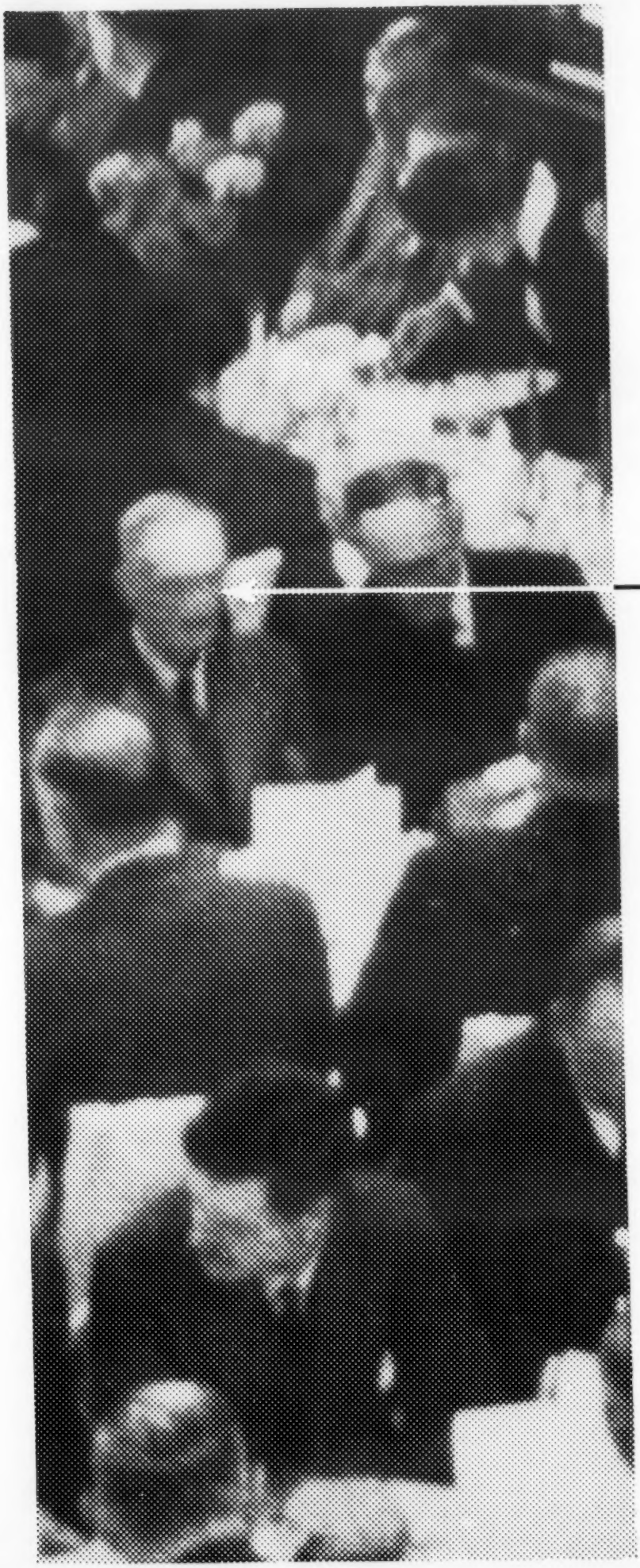

How much has this miller in common with his fellow businessmen?

Basically, like all businessmen, the miller's main object is to make a profit—that's why he's in business, and that's the only reason he will stay in business. To make a profit he must find answers to problems under five headings; finance, plant, labor, raw materials, and sales.

Usually Robinsons are concerned with helping the miller to solve the second of these problems but when required they can (and often do) offer not only advice but also active help with any of the others.

But the really important point is that Robinsons always think in business terms. They understand that the miller is first and foremost a businessman and that therefore the technically ideal solution to his problems is not always the best practical answer.

This then is what Robinsons mean when they talk about millsense: the application of practical business sense to the solving of milling problems.

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Action of Fumigant Mixture in Tests With Confused Flour Beetle Studied

The desirable features of ethylene dibromide and methyl bromide may be utilized to practical advantage by mixing the two fumigants, Harold E. Kazmaier and R. Glenn Fuller, of Batelle Memorial Institute, Columbus, found in a recent study of the action of these two fumigants against the confused flour beetle. The results of the study were published in the December, 1959, issue of the Journal of Economic Entomology.

The authors conclude the mixtures have definite advantages as fumigants for storage space, stored products and in related applications. Because of its high volatility, methyl bromide can act as a propellent and dispersant for the mixture while at the same time utilizing the greater toxicity of the ethylene dibromide, which does not penetrate well alone, the authors state.

Mixtures of ethylene dibromide and methyl bromide gave significantly higher kills of adults and larvae at 2 and 14 days after exposure and of pupae at 14 days than methyl bromide alone, but lower kills than ethylene dibromide, the authors report. Mixtures containing as little as 10% ethylene dibromide generally were much more effective than methyl bromide at a given dosage level. However, there was a marked superiority of the mixtures over either single toxicant in a one-day period. All of the mixtures killed over 90%, while neither toxicant alone gave as much as 50% kill of adults ofter 1 day exposure. At higher dosage levels, mixtures containing 10 and 12 mg. per liter were as effective as ethylene dibromide alone.

Fumigant Treatments

Investigations also were made on the effect of different fumigant treatments on the ability of surviving adults to lay viable eggs. It was found that concentrations of 1 mg. per liter or more of ethylene dibromide were effective in preventing the emergence of larvae from eggs, while lesser amounts were not effective, nor was treatment by methyl bromide alone.

The authors conclude that mixtures containing ethylene dibromide and methyl bromide would have an added advantage over methyl bromide alone in practical fumigation by preventing the rapid build up of a new population from adults surviving fumigation. Commodities treated with these mixtures should thus remain free of insects for a longer period of time before reinfestation occurs.

"The high volatility of methyl bromide is an advantage from the standpoint of dispensing the toxicant and distributing it through space to be fumigated," the report says. "Ethylene dibromide, in contrast, has a low volatility and a relatively high freezing point (50° F.), making distribution difficult under certain circumstances. For these reasons, coupled with poor penetration properties, it has limited usefulness for application alone as a space or stored product fumigant, despite its high order of toxicity.

"It would appear that the desirable features of both ethylene dibromide and methyl bromide may be utilized to practical advantage by the use of mixtures of the two fumigants. Because of its high volatility, methyl bromide can act as a propellant and dispersant for the mixture. Composition of the mixture can be varied to suit the requirements of special fumigation problems by varying the ratio of the components in the mixture," the report states.

—BREAD IS THE STAFF OF LIFE—

Insect Control Building Planned in Georgia

TIFTON, GA. — Preliminary drawings for a new grain insect control building at the Georgia Coastal Plain Experiment Station in Tifton have been completed, reports Dr. Frank P. King, director.

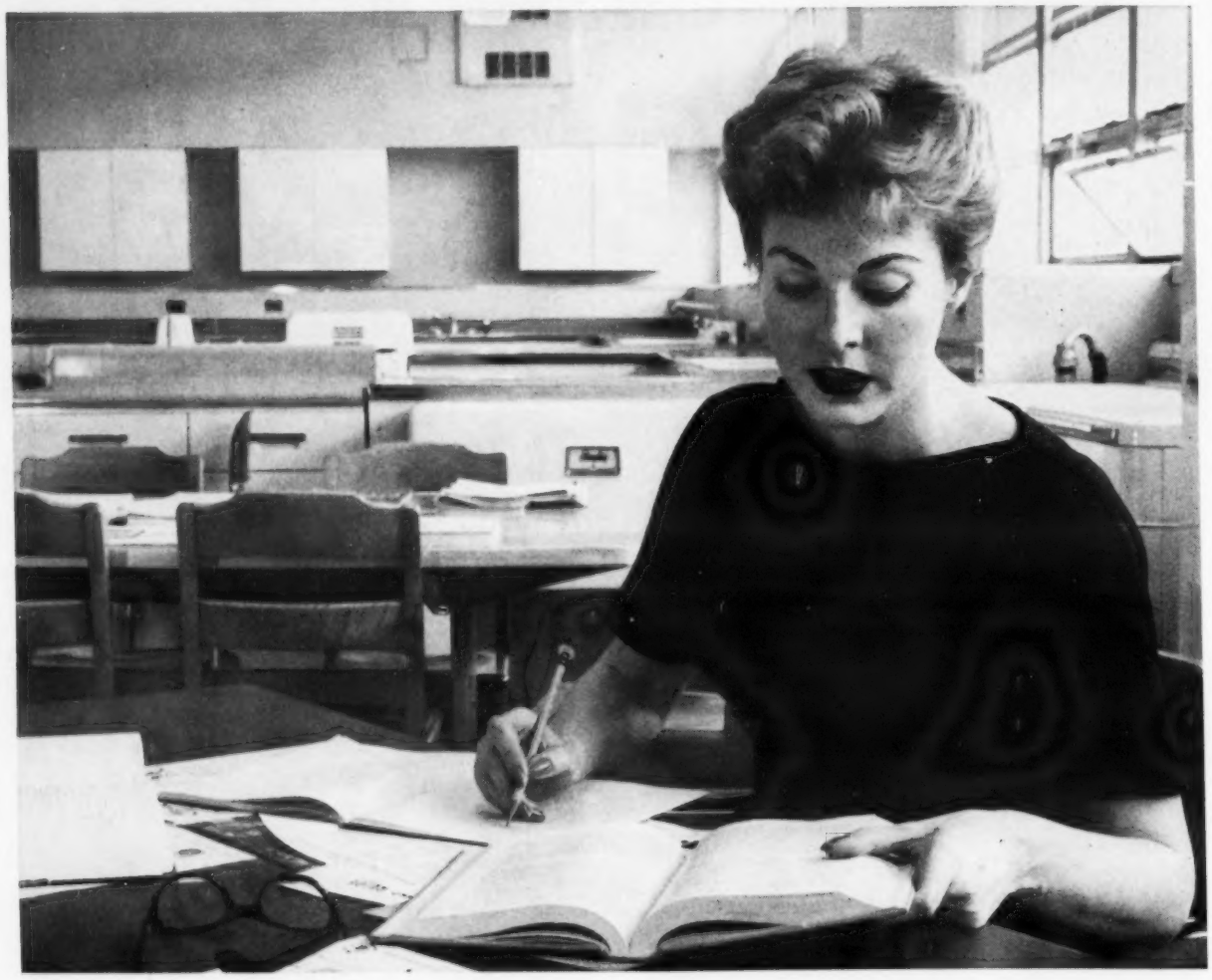
Dr. King said that a contract for the building will be let by July 1. Grain insect research will be carried on from the green to the dried stage here.

The $500,000 project will be constructed by the federal government and will include offices, laboratories, equipment sheds and two greenhouses.

—BREAD IS THE STAFF OF LIFE—

FLOODS HALT SOWING

OTTAWA—Wheat sowing is being held up in the northern Spanish provinces as a result of serious flooding after several weeks of uninterrupted rain. The total area affected is calculated at more than 200,000 hectares (494,000 acres) of wheat-growing land. In view of this emergency, the National Wheat Institute has agreed to supply farmers in the stricken areas, whose wheat-sowing program is being adversely affected by floods, with quick-growing seed wheat.



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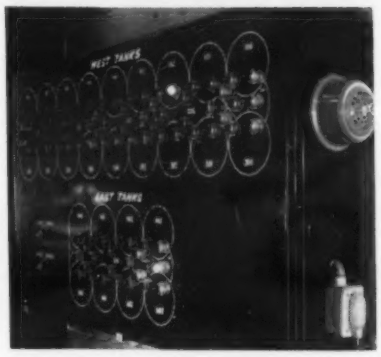


PANEL—Lights on the control panel show at a glance which one of 60 tanks will be filled at ADM's elevator D in St. Paul. The scale operator makes sure the grain will be dumped into the proper tank before the hopper valve is opened.

Switches Eliminate Errors in Handling Of Grain Storage

By eliminating losses from intermixing, a bushel-basketful of precision switches has probably saved thousands of bushels of grain and thousands of dollars at Archer-Daniels-Midland Co.'s terminal elevator D in St. Paul.

Grain coming into the 60-tank elevator is first elevated to scales on the top floor. After recording the weight, an operator opens a hopper to dump the grain onto one of two conveyor belts. Each belt travels through a movable tripper, which rides a 2-rail track to channel the grain into one of three chutes to the proper tank opening.

The tank openings are clearly marked, but, before the switches were installed, occasionally a load of grain went into the wrong tank because the tripper operator misread the tank markings. When the mistake was discovered the tank had to be drained, the grain cleaned and separated, then elevated back to the scale, weighed, poured onto the hopper, run through the tripper and funneled into the proper tank.

To prevent these costly mistakes, ADM engineers installed 64 explosion-proof Micro Switch precision switches to operate lights on an indicator panel near the scale. These lights show at a glance which tank will be filled when the hopper valve is opened.

Each Chute Gate

Each chute gate on the tripper operates switches when it is opened or closed. More switches are bolted to one rail of the tripper track—one at each "station." (From each station the tripper chutes can reach one, two or three tank openings). A station switch plus a chute-gate switch turn on one light on the indicator panel. With one look, the scale operator can make sure the tripper is at the right station and the proper gate is open before he releases the grain. Thus every delivery has two checks: the man on the tripper and the scale operator upstairs.

Although the installation has been finished only 6 months, ADM engineers report the switches have substantially improved efficiency — not one load of grain has gone into the wrong tank. Furthermore, the signal lights save time in efficient grain distribution on the conveyor belts.

ACTUATOR—The T-shaped actuator (on tripper frame to left of wheel) operates Micro Switch precision switch mounted on track rail. Teamed with gate-position switches on the tripper, each rail switch turns on a light at the control panel to show which of 60 tanks at ADM's elevator D will be filled. Spinner roller in background drives conveyor belt.

CANADIAN RYE EXPORTS

WINNIPEG—Apart from slightly less than 120,000 bu. cleared to the U.K., all of Canada's rye exports during the first six months of the 1959-60 crop year went to the U.S., with the over-all aggregate 1,960,000 bu. compared with 1,025,000 in the same period a year ago. Last year for the August-January period only 191,000 bu. of Canadian rye were exported to the U.S., according to figures released by the statistics branch of the Board of Grain Commissioners.

Owens-Illinois, through years of experience, *thinks in packaging terms* in glass and plastic containers, corrugated boxes, closures and multiwall bags.

It pays to buy bags from a packaging specialist

PACKAGING EXPERIENCE assures you of the proper design of the multiwall bag to fit its specific uses, dependability of service to give you the right bag, when and where you need it, and, of course, the finest quality.

Owens-Illinois standards of service, quality control, and design are based on the needs for protection, safe transport, and convenient use of your product.

For the right multiwall bag for every packaging, handling, storage, and shipping method, call Owens-Illinois.

MULTIWALL BAGS
AN OI PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

USDA Notes Research On Grain Cooling

WASHINGTON—Laboratory tests show that grains can be cooled halfway to air temperature in a few seconds when air is blown rapidly through a thin layer of the grain, according to a research report issued by the U.S. Department of Agriculture.

The findings indicate that commercial-scale tests may point the way to practical methods and equipment for precooling grains before shipment or storage, researchers for the Agricultural Marketing Service believe. Such cooling would help to prevent spoilage and insect infestation.

The tests were made with wheat, corn, soybeans, sorghum grain, rough rice, oats and pea beans. Cooling of the grains from their original temperatures halfway down to the temperature of the air took only 2.2-14.4 seconds, the larger grains taking longer time.

The Agricultural Experiment Station of Purdue University cooperated in the study, which is part of an extensive research program to improve the marketing of farm products. A copy of the report, "Cooling Rates of Grain—A Laboratory Study With Maximum Exposure to Airflow," AMS-373, may be obtained from the marketing information division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington 25, D.C.

—BREAD IS THE STAFF OF LIFE—

DEFICIENCY PAYMENTS

CALGARY, ALTA.—In the two months, October and November, 1959, the government of the U.K. paid out deficiency payments on wheat amounting to approximately $8.9 million. The payment amounted to 45¢ a bushel, or the difference between the floor price of $1.89 and the average realized price of $1.44.

INSIDE SCIENCE

THE VITAL STORY OF

Breakfast Cereals

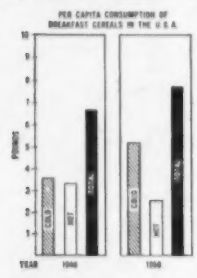
with essential vitamins and minerals restored

by Science Writer

New Edition

America Likes Breakfast Foods

The consumption of the dry type of cereals which are usually eaten cold has increased significantly. It shows a much higher rate of increase in recent years. For instance, in 1958 the per capita consumption of the cold type was 5.1 pounds as compared with 3.5 pounds in 1940. On the other hand, the hot type fell off from 3.2 pounds in 1940 to 2.5 pounds in 1958. Total consumption in this same period increased from 6.7 pounds in 1940 to 7.6 pounds in 1958.



Why are breakfast cereals so well-liked? They are tasty; they are easily served; they appeal to busy homemakers, as well as institutional dietitians, because they are readily available in a variety of flavors at a modest cost. They add interest and value to an important but sometimes neglected meal—breakfast. Their use is extending to between-meal and party snacks, too. Many grains are processed to make breakfast cereals: wheat, corn, oats, rice. Eaten with fruit and milk or light cream, they contribute an excellent combination of basic, flavorful, nutritious foods to the diet.

Better Foods for Better Health Through Restoration

The science of nutrition has advanced rapidly. In the manufacturing process of some cereals, some of the essential "B" vitamins and minerals are subject to some loss, just as with other foods. These losses are inescapable when such grains are prepared for human use. When this became known, manufacturers acted to overcome the losses. They adopted restoration.

Restoration simply means that certain important vitamins and minerals are restored to the cereal food during processing, so that the vitamin and mineral values in the finished product are generally equal to the whole grain values of those elements. Wheat, corn and rice products are customarily so treated. Vitamins B_1 (thiamine), B_2 (riboflavin), niacin (another "B" vitamin), and the mineral, iron, are those most widely restored. Vitamins C and D are also sometimes added.

Pre-sweetened cold cereals emphasize the nutritional importance of added vitamins. Increased calories require more "B" vitamins for best utilization of the food.

Why the Vitamins are Important

Physicians and diet experts have proved that vitamins are essential to prevent certain deficiency diseases and to contribute to robust good health.

Vitamin B_1 (thiamine) helps build and maintain physical and mental health. It is essential for normal appetite, intestinal activity, and sound nerves. A lack of this vitamin leads to beriberi, a rarity in the U. S. A., but still a very serious health problem in other parts of the world.

Vitamin B_2 (riboflavin) is essential for growth. It helps to keep body tissues healthy and to maintain proper function of the eyes.

Niacin is needed for healthy body tissues. Its use in the American diet has been largely responsible for the virtual disappearance of pellagra, a serious disease.

Vitamin D helps children develop normal teeth and bones. It prevents the development of certain abnormal bone conditions in adults.

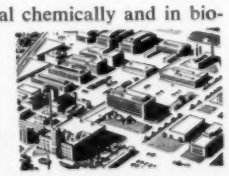
Iron is essential for making good red blood and for the prevention of nutritional anemia.

Where Do the Vitamins Come From?

At about the same time that processing losses in breakfast cereals became known, other developments in the scientific world made available ample supplies of vitamins at economical prices. Thus, the nutritional contribution of some breakfast cereals could be, and was, greatly improved through restoration.

Since the early days of breakfast food restoration and of white flour and white bread enrichment, the world-famous firm of Hoffmann-La Roche has supplied top quality vitamins *by the tons.* Pioneering work in its laboratories and by its collaborators resulted in the "duplication" of some of nature's extremely complex substances. First, the chemical composition of the vitamin was learned. Second, the pure substance was isolated. Third, the "duplicate" was made by synthesis. And fourth, the laboratory techniques were extended to large scale commercial operations.

The manufactured "duplicate" is identical chemically and in biological activity with nature's own product. A vitamin is still a vitamin regardless of whether nature or man made it. So efficient is large-scale manufacturing, that vitamins are sold at a lower cost than if they were extracted from natural sources.



This article is one of a series devoted to the story of vitamin enriched or restored cereal products: white flour, white bread and rolls, corn meal and grits, macaroni products, white rice, breakfast cereals, farina. Reprints of this article, of any other in the series, or of all are available without charge. Please send your request to the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada, Hoffmann-La Roche Ltd., 1956 Bourdon Street, St. Laurent, Montreal 9, P. Q.

Merck Research Expenditures Reach Record High in 1959

RAHWAY, N.J.—Research and development expenditures by Merck & Co., Inc., reached a new company high of $18.6 million last year, Vanevar Bush, board chairman, and John T. Connor, president, announced in the 1959 annual report to stockholders.

"As a result," they said, "research and development expenditures by the company over the past 10 years now amount to $119 million."

They also reported that research activities "will be continued at an even higher level to afford a steady flow of new and improved Merck products in the medical and other fields, with resultant benefits to both the company and the public."

Merck's consolidated net sales totaled $216,913,000 in 1959, an increase of 5% over 1958 sales of $206,636,000. Consolidated net income after taxes increased 8% to $29,988,000, compared with $27,718,000 in 1958. Both sales and earnings were the highest in the company's history.

Sales of all international operations, including direct export from the U.S., amounted to $63 million compared with $56 million in 1958. International sales accounted for 29% of total company sales compared with 27% in both 1957 and 1958.

In 1959, manufacturing facilities were expanded in Argentina, Brazil, Holland, England, Australia and Japan.

—BREAD IS THE STAFF OF LIFE—

Dust Explosion Codes Revised for Industry

NEW YORK—Several American Standard Codes for the prevention of dust explosions in handling grains and foodstuffs have been revised by the National Fire Protection Assn. and approved by the American Standards Assn.

In the grain and feed field, the new publications are American Standard Code for the Prevention of Dust Explosions in Flour and Feed Mills, Z12.3-1959; American Standard Code for the Prevention of Dust Explosions in Terminal Grain Elevators, Z12.4-1959, and American Standard Code for the Prevention of Dust Ignitions in Country Grain Elevators, Z12.13-1959. Prices are 40 to 50¢ a copy.

The American Standards Assn. is the national clearinghouse and coordinating body for standardization. It is a federation of 122 national trade associations, professional societies and consumer groups, with some 2,000 company members.

These new publications are available from the American Standards Assn., Dept. PR128, 10 East 40th St., New York 16, N.Y., or from the National Fire Protection Assn., 60 Batterymarch St., Boston 10, Mass.

—BREAD IS THE STAFF OF LIFE—

Rejoins Prater Firm

CHICAGO—After an absence of 12 years, Morse M. Johnson is rejoining Prater Pulverizer Co. as Michigan representative with Wolverine Elevator Co. of Chesaning, Mich.

Mr. Johnson has 20 years experience in the processing equipment business and is well prepared to render complete Prater service; Wolverine designs, builds, remodels plants and annexes and supplies equipment to the grain, feed and seed industries.

Charles H. Sommer Elected President Of Monsanto

ST. LOUIS — Charles H. Sommer was elected president of Monsanto Chemical Co. and Charles Allen Thomas was elected chairman of the board of directors at the regular meeting of the board, following the company's 58th annual meeting. Mr. Thomas had been president, and Mr. Sommer had been executive vice president.

The board also elected Mr. Sommer chairman of the executive committee and a member of the finance committee.

At the board meeting, Edgar M. Queeny was re-elected chairman of the finance committee. He also remains a board member and a member of the executive committee.

All other officers were re-elected.

Mr. Sommer, who is 49 years of age, was elected to the executive vice presidency and board in June, 1959. He had been a vice president since 1954 and had served as general manager of the organic chemicals division for five years and general manager of the former Merrimac division at Everett, Mass., from 1951 to 1954. He has been with Monsanto since 1934.

Prior to Election

Prior to his election as president, Mr. Thomas had served for four years as executive vice president. He has been a board member since 1942 and chairman of the executive committee since 1949. He will remain a member of the executive committee and finance committee.

Mr. Queeny, son of the late John Francis Queeny who founded Monsanto in 1901, has been associated with the company since 1919. He was elected president in 1928. In his annual meeting remarks, he noted that in the year prior to the time he took over as president, 1927, consolidated Monsanto had 919 employees compared to 31,346 today; and "sales then were $6.6 millions, versus last year's $811 millions; assets, $8.5 millions compared to last year's $951 millions—and by the end of the year we may have climbed into the billion-dollar club."

At the annual meeting, shareowners re-elected 10 members of the board of directors. They are Mr. Queeny, Mr. Thomas, Mr. Sommer, John L. Gillis, Carroll A. Hochwalt, William W. Schneider and Felix N. Williams, all of St. Louis; Herbert Hoover, Jr. of Los Angeles; Trueman M. Martin of El Dorado, Ark.; and Alan H. Temple of New York.

The shareowners voted to increase the authorized common stock of the company from 25,000,000 to 35,000,000 $2-par-value shares. They also approved establishment of a 1960 stock option plan for officers and key employees. The plan supplants the 1951 option plan amended in 1955 and due to expire in July of 1960. It will permit management to grant options for up to 350,000 shares of common stock.

Also Approved

Also approved by shareowners was a second employees' stock plan, but there are no present plans to put it into effect. The plan, which could be activated at the discretion of the board, would make available 450,000 shares of common stock to employees not included in the executive option plan. Eligible employees would be given the opportunity to purchase stock through payroll deductions at 95% of the average selling price quoted on the New York Stock Exchange on the date the plan becomes effective. The number of shares optioned to each employee would be computed on the number of whole shares which, at the option price, would equal 30% of his annual base compensation.

——BREAD IS THE STAFF OF LIFE——

NEW ZEALAND PRODUCTION

CALGARY, ALTA. — Wheat production in New Zealand in 1959 was estimated at a record high of 10.5 million bu. The average yield stood at 55 bu. per acre.

Swedish Firm Buys Packaging Plant

NEW YORK—Arenco AB of Stockholm, Sweden, packaging and processing machinery manufacturer, announced the purchase of the plant and assets of Kisab AB, a producer of a line of high-speed package forming, filling and sealing machines, located in Gothenburg, Sweden. The announcement was made in the U.S. by Roy Johnson, president of Arenco Machine Co., Inc., New York.

The acquisition of Kisab enables Arenco to offer, for the first time in the U.S. and abroad, a line of heat sealing, pouch, pillow and sealing machines with speeds and outputs exceeding many similar existing machines.

The Kisab equipment includes automatic powder and granular products filling and packaging machines with outputs up to 300 per minute, automatic tablet wrapping machines with production capacities up to 300 per minute and liquid, powder and granular products wrapping machines producing 85 heat-sealed packages per minute.

With a Fuller Airveyor Conveying System . . .

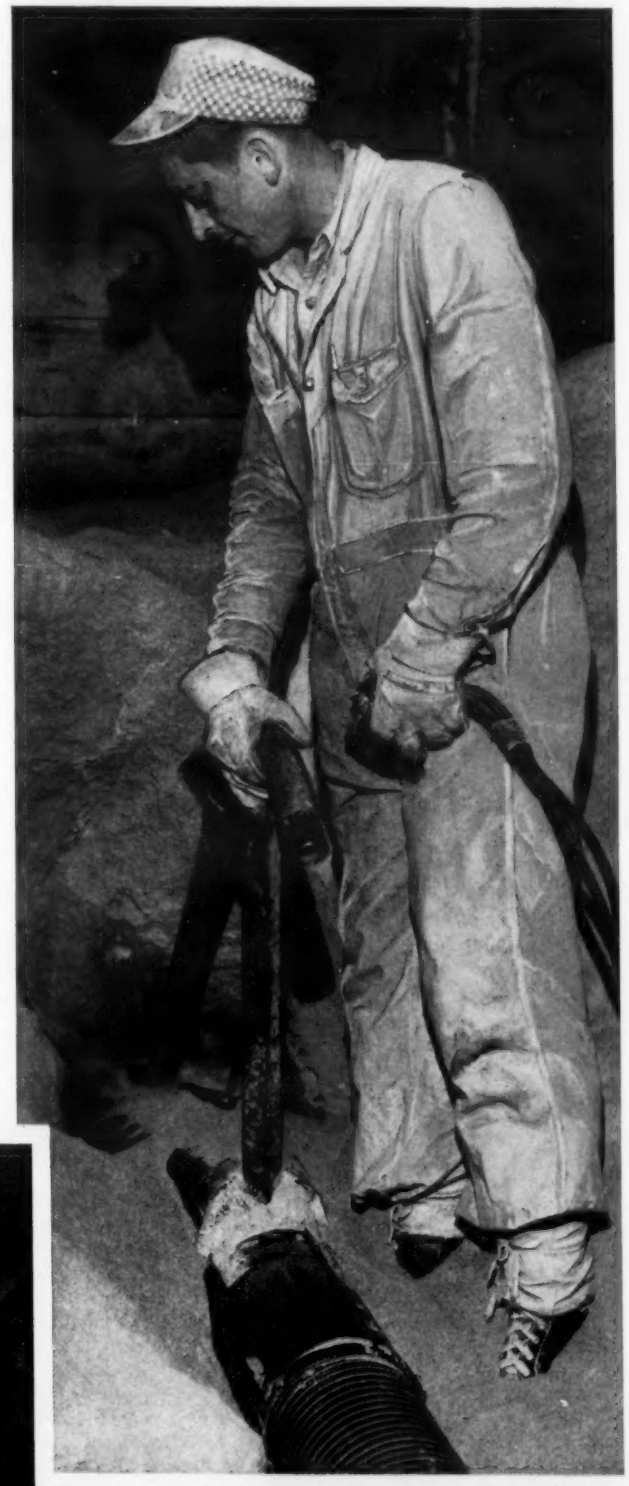
Unloading 30 Tons of Feed Ingredients In Less Than One Hour Is a One Man Job at Ralston Purina

A Fuller Telescopic Airveyor® pneumatic conveying system moves bulk animal and poultry feed ingredients from siding to storage at Ralston Purina's Harrisburg, Pa., mill. The operator keeps the Airveyor nozzle buried in the material by regulating the length of the hose—the telescopic Airveyor conveying system does the rest.

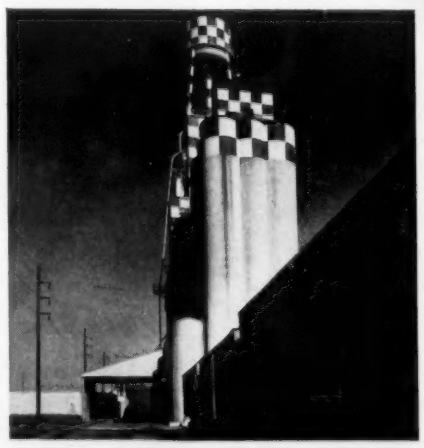
Soybean meal, midds, bran, and other ingredients are sucked vertically 165 feet up 12 stories to any one of 30 storage bins. As the operator works deeper into the car, he simply pushes a button to raise or lower the hose one foot or twenty to reach *any* point within the car. Work never stops to add or take off sections of hose.

Obtaining the savings inherent in bulk purchasing, eliminating the dust hazard, and greatly reducing handling costs are some of the ways Fuller Airveyor conveying systems cut operating expenses in the moving of dry, bulk materials.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1323C A282



Operator controls unloading of feed ingredients at rate of 30 tons an hour — up 12 stories to storage, just by pushing a button.



FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
156 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
. . . . pioneers in harnessing AIR

Workers 'Dressed to Kill' Present Hazards Which Could Result in Injury, Even Death

Unsafe work clothing can be a major accident hazard. Many firms are putting their employees into uniform in an attempt to beat the problem. Insurance premiums and compensation claims are becoming so high these days that preventing even one major accident may well pay for a uniform program for many years to come. Joseph Kirshbaum, president of the Institute of Industrial Launderers, outlines the problems, pin-points the dangers and suggests a solution.

The question is—Why would our employees be better off in uniform than they would wearing work clothing which they furnish themselves?

Where employees of a mill furnish their own work clothing, they may well be reporting on the job "dressed to kill." Experience has shown that people wear to work clothing which they consider "not good enough for anything else."

Unfortunately, such clothing has many "built-in" accident hazards. Consider, as an example, an accident that is relatively commonplace in North American industry: A worker has a button missing from the cuff of his shirt sleeve. It doesn't seem important and he ignores it—until the dangling cuff gets caught in the jaws of moving machinery and pulls him along with it. If he's lucky, he will lose only his arm. If he is unlucky, he may well be mangled or killed.

Or consider another "typical" accident: A worker reports on the job at your mill wearing a pair of old trousers that he has furnished himself. Naturally, such trousers, once (long, long ago) having been used for regular wear, have cuffs on the pant legs. The man climbs up a ladder to inspect some equipment. The cuffs catch on a projection. He falls—landing on a concrete floor. At the compensation hearing, his doctor testifies that he is disabled for life. It happens almost every day. There are a million things that trousers with cuffs can catch on, resulting in crippling—and expensive—falls.

How your employees should not look.

Consider just one or two more "typical" accidents which involve work clothing. Burns are a major hazard. Where employees work near flammable substances: Oil, grease, chemicals, and so forth, they may be turned into human torches by so casual an act as lighting a cigarette.

It doesn't take an Einstein to figure out that flammable clothing (or clothing which has been impregnated with dust or foreign materials which can cause skin irritation) should be changed frequently in favor of fresh, new clothing.

Actually, in practice, where employees furnish their own work clothing, it simply doesn't happen that way. Greasy clothing creates a mess in the family washer, which wasn't designed to (and cannot) remove stubborn industrial stains. The housewives object to laundering it, because it makes such a mess. The worker figures, "What the heck—it's only going to get dirty again anyway." So he lets longer and longer times elapse between washings. Such dirty garments are an obvious health and accident hazard. Dirt and germs can hitchhike into the plant on such clothing and are Johnny-on-the-spot to infect scratches, cuts, or other trivial wounds.

In the same way, loose or floppy clothing can get caught in machinery or cause falls. So can dangling ties, loose belts, and many other common conditions found in garments of the "not good enough for anything else" variety supplied by the workers themselves.

The trade association of which I am president, the Institute of Industrial Launderers, has devoted much time to the subject of garment safety. We have worked with the National Safety Council, the American Standards Assn., and other groups to draw up recommended safety standards for work clothing. We hope these examples convince you that this oft-neglected subject is worthy of consideration. Defects in work garments can cause serious trouble.

Member companies of the Institute of Industrial Launderers insist upon one iron-clad rule—that any rips, tears, and the like on work uniforms they supply be mended immediately after laundering and prior to return to the employee. The same top-priority treatment is given to the replacement of missing buttons. If your company does not use the services of an industrial laundry, it is advisable—and wise—for you to insist that employees do.

As well as being costly in human lives and misery, accidents are also enormously expensive to any business—and the cost of insurance premiums and compensation claims seems to be skyrocketing more and more every year.

Selecting a Work Garment

Let us turn from the subject of safety to the matter of factors to consider in selecting a work garment for your employees.

Surprisingly, this is not always as simple and easy as it may seem. I recall the case of one nation-wide company which adopted a uniform it was confident would make its tens of thousands of employees (all of whom were in the business of serving the public directly) the best-dressed men in their highly competitive field.

In the offices of a top executive of the company, the uniform looked wonderful on a model. It was fashioned after the uniform worn by a five-star army general—but it did the general's garment several points better by having many bright "fruit salad" features as additional decoration.

However, the uniform chosen by the public relations people and the advertising executives, none of whom had had any practical uniform experience, and working without expert, impartial advice, proved to be a costly failure.

The uniform that had been selected was wrong, for several reasons. First, it was not suited to on-the-job conditions. The employees who wore it pumped gasoline, greased cars, and did a good many other things in their daily work that were never done by the famous general for whom the garment was designed.

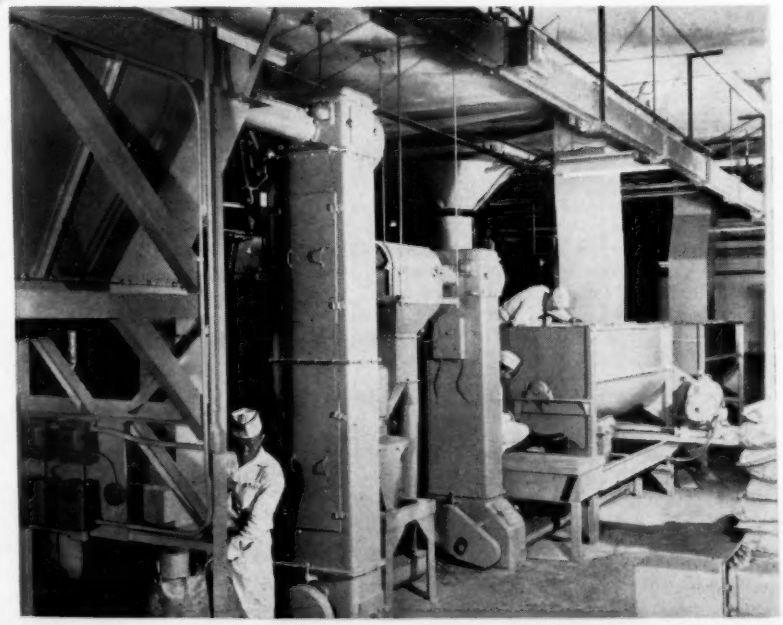
Secondly, the uniform could not be laundered. It had to be dry cleaned and, under the company plan, the employees were supposed to have this done very frequently at their own expense. It might reasonably have been anticipated that the employees would resent this very high cost, but it wasn't.

As a result, some of the employees wore their uniform for weeks, and even months, without having it dry cleaned. Some tried to launder the uniforms in the family washer. Result? In no time at all, the vast majority of the employees wearing this expensive uniform looked like as motley a crew as was ever seen in the gasoline retailing industry. (This same unhappy result could well occur to anybody in any industry if they select the wrong work garments!)

After considerable financial loss and loss of face, the uniform was finally abandoned. The moral of this story is that uniforms should be practical and suited to the on-the-job conditions for which they are to be worn.

Tests Are Important

When selecting a uniform, it is wise to first have it tested to see how long it will hold up. The uniform salesman,



NEATLY UNIFORMED EMPLOYEES accentuate the cleanliness and sanitation of a well-run plant. Dirt and germs can't hitch-hike into the product. A good, clean plant means a good clean product.

THE NEW LOOK

On July 11, THE Northwestern MILLER will appear in a new dress. It will be more convenient to handle—the page size will be smaller — and streamlined presentation will give the reader all he needs to know speedily and succinctly. Color will be freely used to highlight important points, statistical tables and charts. One major improvement of interest to the reader will be the adoption of a new type face which will be easier to read. That type face is used in the accompanying article. The article itself is typical of those scheduled to appear in the future backgrounding developments important to the grain, flour milling and baking trades.

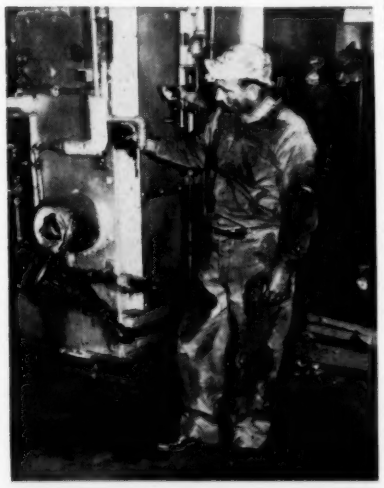
EVEN SIMPLE UNIFORMS have great advantages. They eliminate "built-in" accident hazards involved in the wearing of clothing which employees furnish themselves.

anxious to make a sale, is often not the ideal person to conduct these tests.

Let me point out that the laundering of the uniforms at low temperatures in mild soap is not an adequate test either. They should be laundered several times under the actual conditions they are likely to meet. Then you can observe such factors as shrinkage, color fastness, tensile strength loss, and the like.

On the basis of long experience, member companies of the Institute of Industrial Launderers have come forward with a number of recommendations with respect to work clothing:

- Cotton uniforms are usually the best for most purposes. Cotton stands up better, can be laundered cheaply and easily, and looks good for its lifetime.
- Standard colors (of which there is a very wide variety easily available), usually are best for most work uniforms.
- Fancy, "fruit salad" features should be avoided. They look fine at first but are often impractical, cause problems in laundering, and their over-all effect on the uniform is nearly always detrimental in the long run. In addition, such features are often very expensive.



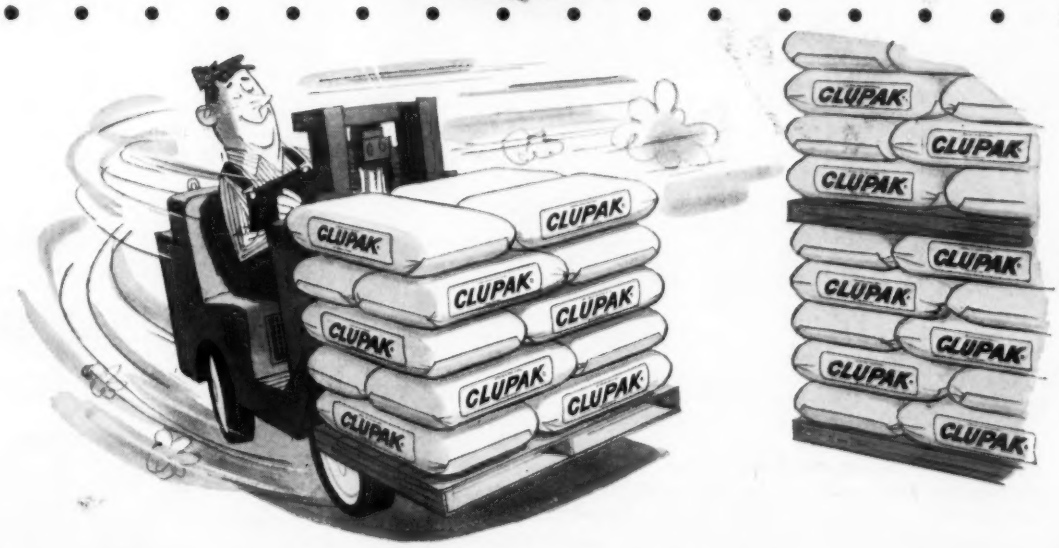
BEFORE—This worker looks like something you'd use to scare crows away from the wheat field. Oil-soaked clothing is a fire hazard and irritating skin rashes are most certain to follow the wearing of such clothing.

- Eye appeal and company identification can easily be obtained by the use of attractive, well-designed company emblems. These, used in connection with the standard color uniform, focus the eyes of the viewer where they should be—on the emblem, which carries the company's identification and perhaps its advertising message.
- Drivers, who deal with the public, should always be in uniform, and the uniforms should always be clean and attractive. Thousands of persons are likely to see your drivers in the course of a week. Making them walking advertisements, neat and attractive, is the cheapest and most effective advertising you can get for the money. In addition, identification is an important advantage. It proves to people that the man claiming to represent your company is really employed by you.
- Group identification is an advantage which uniforms offer to large plants. If you have a large plant, it is sometimes helpful to dress foremen in a uniform of a slightly different color than other employees. This identifies them immediately. Sometimes it is helpful, in larger plants, to dress employees of different divisions or sections in slightly different colored uniforms. Then if anybody is out of place, loafing, or where he shouldn't be, it is immediately apparent.

Free Advice About Uniforms

Suppose that you are interested in adopting a uniform or changing the uniform your workers wear. How do you go about it? One way would be to take advantage of the free consulting service maintained by the Insti-

END BAG DAMAGE... use multiwalls made of CLUPAK* extensible paper!



NEW, TOUGHER KRAFT SOLVES BREAKAGE PROBLEMS

New CLUPAK extensible paper offers multiwall buyers a happy choice . . . Because CLUPAK extensible paper has a patented, built-in stretch and "give," it simply absorbs most shocks and strains that rip, split or tear conventional kraft. By specifying CLUPAK extensible paper in your kraft bags, you solve your breakage problems once and for all. And multiwalls of CLUPAK extensible paper fill faster, palletize better and handle easier.

Millions of these new multiwalls have proved the advantage of this tougher, stronger paper. Plan a trial shipment of multiwalls, made of CLUPAK extensible paper, as part of your next bag order. Use the CLUPAK trademark when ordering and look for it on the bags. Only then can you be sure the bag paper meets the rigid strength specifications established by Clupak, Inc. for your benefit.

*Clupak, Inc's. trademark for extensible paper manufactured under its authority and satisfying its specifications. Clupak, Inc., 530 5th Ave., N. Y. 36, N. Y.

tute of Industrial Launderers. The institute for several years has operated a free, impartial consulting service for companies which feel the need of advice. Hundreds of companies have used it. It will make available, without charge or obligation of any kind, expert, practical men in the field to consult with responsible company officials.

There are no strings of any kind attached to this service. The institute has no axe to grind. The product of no individual uniform manufacturer is recommended, nor are the services of any individual laundry recommended for maintenance. Instead, general specifications are recommended which will make sure that the uniform adopted will suitably meet the on-the-job conditions of the company concerned.

Why is the institute going to this trouble and expense? Simply as a public service and to increase the total number of work uniforms in use. We don't want people to have unfortunate experiences because they choose unsuitable uniforms and give up the whole project.

Incidentally, if you're interested in having help on your uniform problems, drop a line to the Institute of Industrial Launderers at 1833 Jefferson Place, N.W., Washington 6, D.C. ★

AFTER—Quite a change! With the donning of this neat, simple uniform, this man immediately becomes far safer. His morale and self-respect are bound to be improved, too. He will be proud of his job and of his product.

—BREAD IS THE STAFF OF LIFE—

INEQUALITIES RESULT

WINNIPEG—Inequalities in grain delivery quotas in some parts of the prairie provinces result from the need to move substantial quantities of tough and damp grain to Fort William and Port Arthur terminals for drying, Trade Minister Churchill told the House of Commons in Ottawa. He forecast an equalization of delivery opportunities before too much time had elapsed. The minister said hundreds of box-cars were moving to take grain from country points.

Railroads File Freight Rate Cuts For Grain Products

DULUTH, MINN. — Sharp freight rate cuts on shipments of wheat, rye and flaxseed to the Twin Ports and the Twin Cities have been filed with the Interstate Commerce Commission, five area railroads announced.

The Duluth, Missabe & Iron Range; the Duluth, Winnipeg & Pacific, the Great Northern; the Northern Pacific and the Soo Line said reductions up to 13½¢ on each 100 lb. of commodities are being sought to counter truck competition.

The reduced rates would be applicable from all country grain elevators in Minnesota, the eastern half of North Dakota and northeastern South Dakota to the primary grain markets in Duluth-Superior and Minneapolis-St. Paul.

Participating railways will permit sampling and inspection at interior points in addition to storage in transit west of the two locales.

—BREAD IS THE STAFF OF LIFE—

Commission Releases Report on Starch

WASHINGTON — The U.S. Tariff Commission has released a report on its investigation of starch, No. 332-37, conducted under section 332 of the Tariff Act of 1930, pursuant to a resolution adopted Sept. 2, 1959, by the finance committee of the U.S. Senate.

The Commission's report describes the respective domestic industries engaged in the production of wheat, corn and potato starch. It contains statistical and other information on raw materials used, employment and wages, prices, U.S. production, exports, imports and consumption, and gives general information on the manufacture of starches in the principal foreign exporting countries.

New DAY "RJ" Dust Filter

CONTROLS DUST SAVES DOLLARS

only 3 moving parts

Built under patents of The DAY Company and H. J. Hersey, Jr.

Because of its new, simplified design the DAY "RJ" dust filter will save you many dollars on initial investment, installation, operation and maintenance. Some of the important new construction features of this dust filter are: a new, quick-opening reverse-air, counter-flow valve for maintaining filter media porosity; a new, reverse-air pressure blower arrangement, and new, air tight, yet quickly opened inspection doors.

This patented DAY dust filter has only 3 moving parts but controls dust effectively, efficiently (99.99+%) and economically. It represents the latest refinement in a long-tested, plant-proven dust filter. Using felted filter sleeves to capture dust, the "RJ" is now available in 5 sizes for handling from 300 to 6400 CFM of air (for larger capacities, multiple groupings are furnished).

For more detailed information write toDAY for free Bulletin G-30. It's filled with facts, specifications and dimensions.

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Grain Credit Topic Of California Unit

SAN FRANCISCO, CAL. — The first meeting of the committee to investigate the question of excessive grain credits in the California market has been held under the leadership of Ernest A. Silverfield, Continental Grain Co.

The newly-organized committee is composed of the following members: D. Berger, Berger & Plate Co., San Francisco; Jed Burns, Jed W. Burns Co., San Francisco; Blair Erigero, Pillsbury Co., Stockton; J. Morgan; O. Wilkinson, E. D. Wilkinson Grain Co., Stockton, and H. V. Nootbaar, ex officio, H. V. Nootbaar & Co., Pasadena.

The committee has offered several suggestions for credit procedure for considefation by members of the industry. These suggestions, in summary, are as follows:

"(a) Basic term of payment should be net cash upon receipt of invoice.

"(b) Interest and/or carrying charges should be applied against all overdue accounts, beginning not later than 10 days after date of invoice, and payment of these charges should be strictly enforced.

"(c) Every member of the industry is strongly urged to consider for himself the suggestions made, and to point out to his clients that the interest and/or carrying charges are not what he is seeking, and that such charges are only made to reimburse the supplier for being deprived of the use of his own capital.

"(d) It is of extreme importance that credit information between members of the grain and feed ingredients trade be exchanged through an impartial agency. The California Credit Managers Assn. appears to be the most suitable organization."

The grain credit committee was appointed by an over-flow crowd at a meeting of the grain trade recently, when the whole question of the abuse of credits in the California industry was aired.

At that time, it was noted that the margin of profit in the wholesale grain and feed ingredients business does not permit payment terms other than "cash against invoice," or at best, "cash against delivery."

In some cases, extending credit has induced the customer to overextend his credit, in turn bringing about substantial losses, it was noted.

The small margin of profit makes it imperative for the wholesaler to turn over his money twice a month, and while payment of interest on over-due accounts is imperative, it is not the answer to the problem, it was pointed out. Customers who need credit, the industry feels, should seek it through proper channels.

As far as can be determined, California is the only state that extends credit in the grain wholesale industry.

—BREAD IS THE STAFF OF LIFE—

'HOPPER' AREA NOTED

WINNIPEG—A slight reduction in severity and total area of grasshopper infestation is forecast for 1960 on the prairies. For the past two years outbreaks have been fairly serious. Light or moderate infestations are forecast for 78 townships in Manitoba, 797 in Saskatchewan and 295 in Alberta. Severe infestations are forecast for 38 townships in Saskatchewan. In Alberta the infested area is considerably larger than in 1958 or 1959.

Appropriation Granted For Research Project

OLYMPIA, WASH. — An appropriation of $4,975 was recently approved by the Washington State Wheat Commission to continue four research projects being conducted by Washington State University.

Wayne B. Gentry, manager, explained that one of the most important of the grants concerns breeding of faster emerging winter wheat of the short-straw or semi-dwarf variety. If the milling characteristics of this prove sufficient, it will permit higher yields—an important factor to producers faced with increasing costs and lower wheat prices.

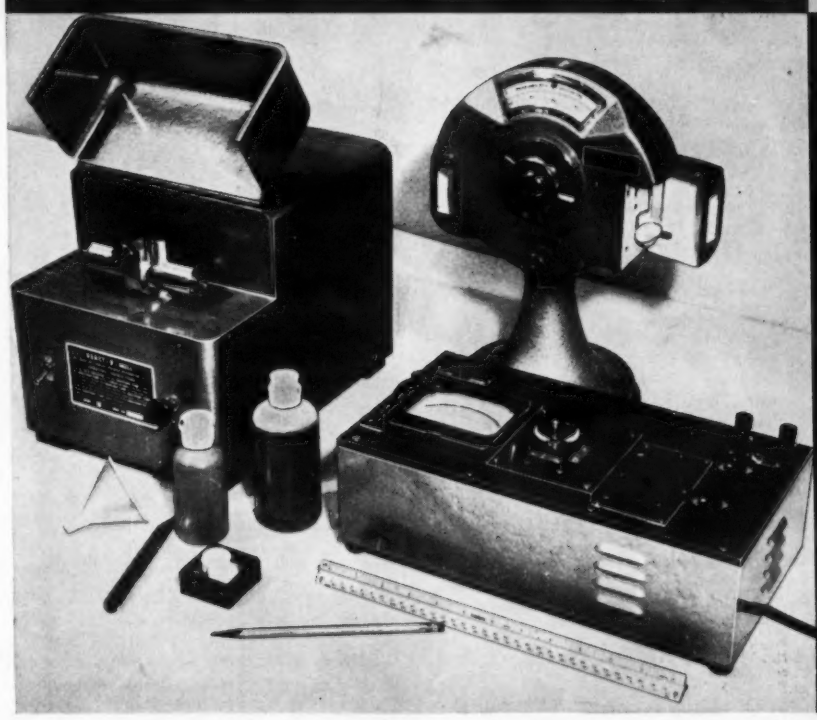
Other grants concern the control of cheat-grass in wheat; a genetic study involving rapid emergence of winter wheat, and a survey of little-known fungi invading wheat roots and crowns in Washington's dryland region, Mr. Gentry said.

These additional funds allow continuation of the grants through June 30, when they will be placed on a fiscal year basis until completion.

FLAX EXPORTS

WINNIPEG—Canada's flax export pattern remains unchanged, with all clearances going to overseas countries. During the period from August-January of the current crop year the movement reached 5,096,000 bu. compared with 7,938,000 bu. for the same months of 1958-59, the statistics branch of the Board of Grain Commissioners reports. Clearances to the U.K. totalled 2,953,000 bu., while 1,146,000 went to Japan; 518,000 to the Netherlands; 167,000 to Germany, and 136,000 bu. to Belgium. Other destinations listed were Denmark, France, Greece and Portugal.

test protein on the spot . . .



with this new 5 minute test

High protein means extra money in your pocket . . . but first you've got to find and measure it!

Now you can make your own reliable protein tests in five minutes or less . . . no more days of waiting for laboratory analysis. This means that you can bin your grain or flour by protein percentage *as soon as it's received* . . . blend your incoming shipments for the top resale profit.

This amazing new development, the UDY PROTEIN ANALYZER, introduces a newly discovered principle that now makes possible fast, economical, accurate "on the spot" analysis. You operate it simply without special skills or training.

Whole grain wheat is analyzed by weighing a specific sample and adding a measured amount of a special dye solution which reacts quantitatively with the protein. The sample is then wet milled in the unique React-R-Mill for three minutes. Reaction of the dye with protein is then complete and the remaining unbound dye is merely measured in the color analyzer. This reading is converted directly into protein percentage. Flour is analyzed in the same manner except that milling is unnecessary.

Phone, wire, or write now for further information on increasing your profits with the new UDY PROTEIN ANALYZER. Since production of these units is still limited, your early response may be particularly important.

for full details contact . . .

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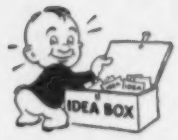
Worth Looking Into

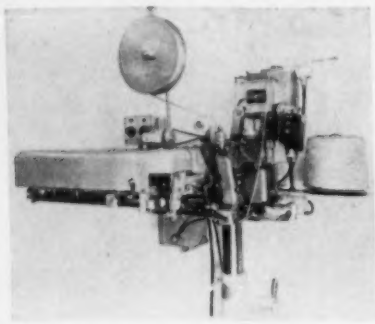


New Products
New Services
New Literature

This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 2182—Tape-Top Bag-Closing Machine

A thermoplastic tape-top bag closing machine designed to apply a thermoplastic tape closure over sewing on open-mouth multiwall shipping sacks



has been developed by Bemis Bro. Bag Co. The machine, which was designed and built by the company's packaging service unit, effects a bag closure providing maximum protection against contamination from outside particles, prevents infestation of bags and eliminates sifting of fine products. The closure creates a moisture barrier to prevent "caking" of hygroscopic products and retains its physical and chemical characteristics over the full range of temperatures encountered in bagged products. The unit utilizes a special thermoplastic tape, Bemistape 400, to make the new closure. The tape, a development of the company's department of physical research, is economical in cost and provides maximum strength with respect to tensile and tear, it is claimed. For details, check No. 2182 on the coupon, clip and mail.

No. 2183—Catalog on Bucket Elevators

The publication of a catalog on bucket elevators, complete with all specifications, was recently announced by the Andrews Machine Co. This new catalog covers both belt and chain elevators in single and double casing design. Three standard series are included in a range of capacities from 225 to 7,125 bu. an hour. In addition to all standard dimensions and specifications, complete formulas are furnished to determine variations that may be desired to meet special requirements of all grain, flour and feed elevating. Step-by-step information is furnished on determining general elevator requirements, selecting the proper specifications, and pricing the complete elevator. A copy of this comprehensive catalog may be secured by checking No. 2183 on the coupon, clipping and mailing it.

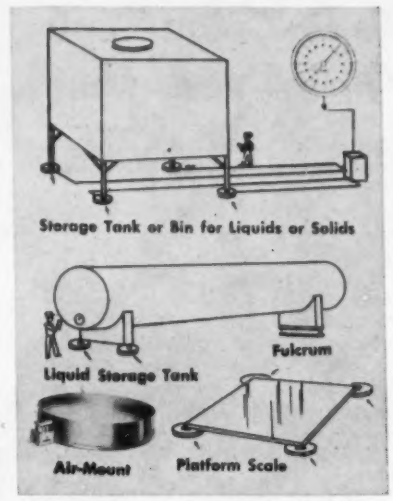
No. 2181—Fumigant Package

Ferguson Fumigants, Inc., announces it now has a lithographed can for its Dawson 37 fumigant. The can is identical to that commonly used for methyl bromide and can be opened with any of the commonly used methyl bromide can opening devices. Dawson 37 is a mixture of 30% ethylene dibromide, 70% methyl bromide, by weight. It is packed 24 cans per case, and is especially adapted to

the fumigation of boxcars, fumigation chambers, small rooms, empty bulk flour bins, the head space in partially full bulk flour bins and cereal products under polyethylene tarpaulin. This fumigant mixture is said to be especially effective in boxcars or other space where the leakage factor is high, and therefore considered difficult to fumigate. The fumigant has a strong odor, adding to the safety factor in connection with this application. A recently published research paper suggests it is an especially fast insect killer—capable of killing insects in all life stages, at very low dosages. For details, check No. 2181 on the coupon, clip and mail.

No. 9174—Weighing System

The Weber Air-Mount Weighing System for weighing the contents of bins, tanks, truck tanks, conveyor loads and also anything that can be weighed on platform scales, is now available for loads covering the range from 0-300 lb. to 0-200,000 lb., announced the Weber Air-Weigh Co. The units have a repeatable accuracy of better than 1/10 of 1%, the company says. The system is operated by a small load-cell placed under each leg of a tank, bin, conveyor section, or platform. Linear pneumatic pressure is automatically controlled in each load-cell and produces a pneumatic signal on a meter, which may be located remotely. Feature of the system is the saving in installation costs, the company says. For details, check No. 9174 on the coupon and mail.



No. 7858—Dust Control Brochure

"Freedom from Dust" is the title of a 28-page brochure recently published by Dracco Division of Fuller Co. The brochure describes a complete range of dry collection equipment. Shown are ways of using cloth filtration and cyclonic equipment for eliminating dust control and air pollution problems in industry, the company says. Data and specifications on the "Multi-Bag Filter," "Uni-Filler," "Glass-Bag Filter" and "Whirl-Clone," are included. Also described are special collectors and accessories. Illustrated application data shows how industry uses the equipment to collect waste dust, or to return valuable, reusable material to the manufacturing process. For copies, check No. 7858 on the coupon and mail.

Send me information on the items marked:

- ☐ No. 2181—Package
- ☐ No. 2182—Bag-Closing
- ☐ No. 2183—Elevator
- ☐ No. 4470 Marking Ink
- ☐ No. 7789—System
- ☐ No. 7816—Buggy
- ☐ No. 7842—Modernization
- ☐ No. 7858—Brochure
- ☐ No. 7863—Machine
- ☐ No. 9174—Weighing

Others (list numbers) .....

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7358

No. 7816—Low Beam Weigh Buggy

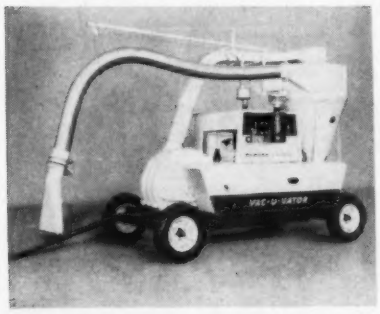
A weigh buggy has been developed by Leach Manufacturing Co. designed with a low beam to permit clustering of ingredient bins two or more deep. The Lemanco Weigh Buggy comes in two models—900 lb. and 1,200 lb. capacities at approximately 40 lb. of feed per cubic foot. Both models have an over-all height of only 42 in. The scale beam has a capacity of 1,300 lb. permitting building up sides of weigh buggy where height is no problem, the company says. For more information, check No. 7816 on the coupon and mail.

No. 7789—Cut-off System

The Howe Scale Co. announces a "Magnetic Reed Cut-off System" for accurate cut-off of scale loading. Designed for use with Howe Tape-Drive Scales, it is available for single or multiple ingredient control. It consists of a magnet, reed switch and relay. The magnet is attached to the top of the scale indicator. A reed switch is fastened to the end of a movable arm, mounted on the inside of the dial glass. By means of a knob, the switch can be positioned slightly inside of any point along the one described by the indicator magnet. To complete the circuit, the two ends of the switch are wire-connected to the relay. The company says the unit minimizes the maintenance normally required for more complicated electronic or mechanical systems commonly used in batching and loading installations. For details, check No. 7789 on the coupon and mail.

No. 7863—Grain Moving Machine

A grain moving machine, the 3500 Series Vac-U-Vator, has been announced by Dunbar-Kapple, Inc. According to company literature, grain can be elevated up to 100 ft., or 20 ft. higher than previous Vac-U-Vators. Grain conveying distances up to 600 ft. can be handled, an increase of



about 20%. The unit is also 18 in. lower than previous models, permitting greater mobility. Power units available include an International Harvester V-8 gasoline engine or a Cummins diesel engine. The machine consists of a power unit, compressor and receiving cyclone, all mounted on a four-wheel chassis. This series is built on a large frame. Details can be secured by checking No. 7863 on the coupon and mailing.

——BREAD IS THE STAFF OF LIFE——

RUMANIAN ELEVATOR

WINNIPEG—A Canadian firm has been given the job of constructing a 250,000 bu. elevator on one of Rumania's biggest state farms. Canada will supply the men and machinery. Also, Rumania has purchased seed corn sufficient for more than 1 million acres and 200 tons of soybean seed.

No. 4470—Code Dating, Marking Ink

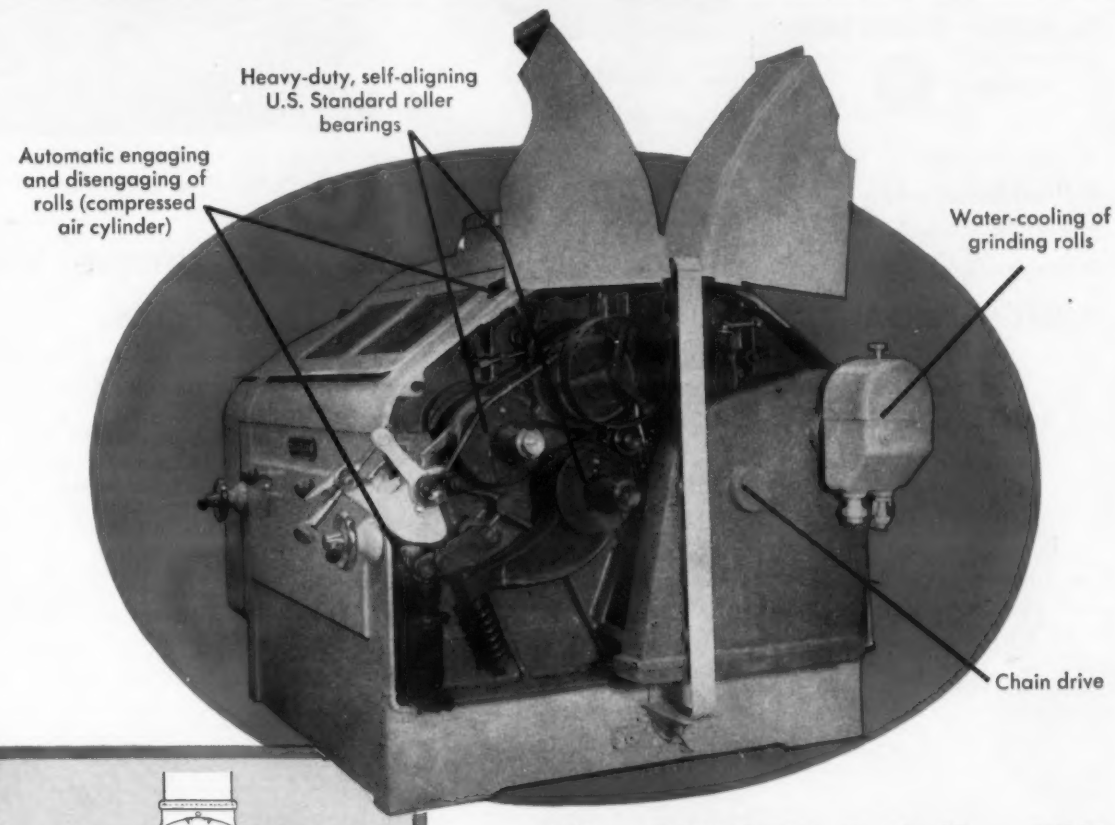
Kiwi No. 25 waterproof code dating and marking ink for use on waxed paper, aluminum foil, cellophane and other hard-to-mark surfaces, is now available from Kiwi Coders Corp. in 4 oz., plastic, non-breakable bottles and larger containers in all standard colors. The product is said to dry quickly on the material, but to remain moist and fresh on the stamp pad or inker. For details, check No. 4470 on the coupon, clip and mail to this publication.

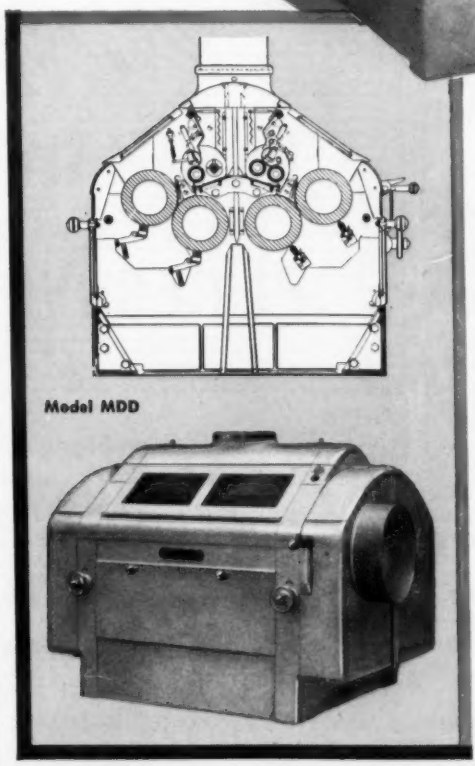
No. 7842—Mill Modernization

Ideas for modernizing feed mills are contained in an engineering brochure prepared by Paul Berg, consultant. It is illustrated and includes descriptive information. The brochure is indexed and covers a wide range of equipment found in a feed mill. Application information and methods to plan modernization are included. For copies of the brochure check No. 7842 on the coupon and mail.

PAYMENT AUTHORIZED

WINNIPEG—The board of directors of Saskatchewan Wheat Pool recently organized an interim payment of 30¢ per bu. on rapeseed delivered to the 1959-60 pool. This brings payment on pooled rapeseed to $1.80 per bu. including the initial payment of $1.50 on delivery. Saskatchewan farmers have delivered about 650,000 bu. of rapeseed to the co-operative pool since the beginning of August. The interim payment, which was to become effective March 28, will mean distribution of about $195,000 to farmers who have pooling contracts.


Heavy-duty, self-aligning U.S. Standard roller bearings
Automatic engaging and disengaging of rolls (compressed air cylinder)
Water-cooling of grinding rolls
Chain drive



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More than 70,000 BUHLER-*Built* Roller Mills are in operation throughout the world. *That's more than any other make.* Here are some of the reasons:

Better Milling Results . . . are obtained through uniform grinding due to even and fully automatic feed, highest quality rolls, and precision adjustments.

Less Power Needed . . . Self-aligning roller bearings permit higher operating speeds and higher output, yet need up to 20% less power than conventional sleeve bearings.

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Highest Degree of Sanitation . . . New BUHLER design provides no dead corners in which insects may breed.

Low Maintenance Costs . . . due to sturdy design, high quality materials, and highest standards of workmanship.

OPTIONAL FEATURES

Automatic engaging and disengaging of grinding rolls to prevent damage when running empty.

Chain instead of gear drive.

Water cooling to keep product cool. Greater uniformity, better control of moisture loss, easier sifting.

4-speed regulator for feed rolls.

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DAWSON LOW-DOSAGE FUMIGANTS

DAWSON is a registered TM

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- **SURE**—EFFECTIVELY KILLS ALL STAGES OF INSECTS PLUS RESIDUAL ACTION
- **FAST**—NO BOTTLES TO FILL NO BOTTLES TO BREAK LARGE NUMBER OF CANS MAY BE CARRIED AT ONE TIME LESS SHUT-DOWN TIME NEEDED SHORTER EXPOSURE PERIOD REQUIRED

YOUR ASSURANCE

Economical, effective, trouble-free spot fumigation is assured by our national reputation. We are the original developer of Dawson 73 Low Dosage Spot Fumigant (U.S. Patent No. 2,606,857). We serve a large percentage of the milling capacity in America today. Their own experience with our materials is a further assurance. Inquiries invited. We are a trained, experienced service organization dedicated to helping you get the best results at the most economical cost.

Call or Write Dept. "T" for Complete Information

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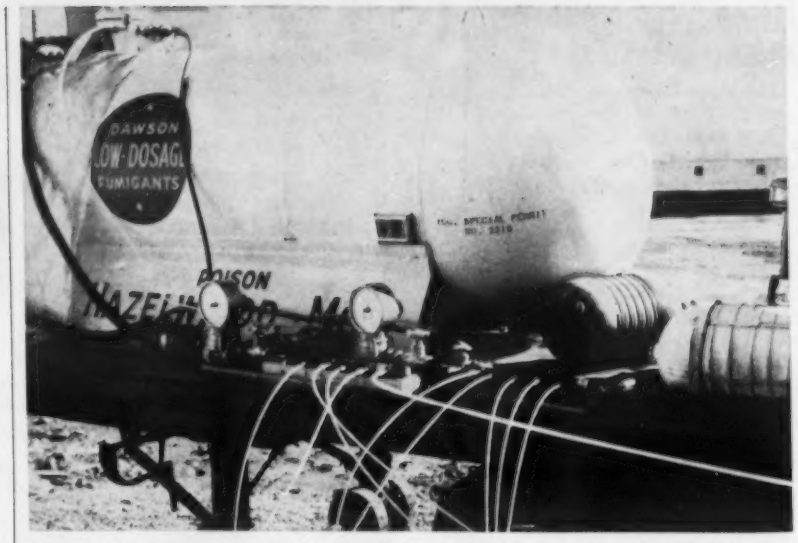

Dawson 37 fumigant moves from this tank, on an over-the-road tank trailer, through the meter and head assembly, and on into the bin, by means of the attached tubing.

Grain Bin Fumigated with Unique Use Of Portable Tank and Truck-Trailer

A large flat-storage grain bin was fumigated in January with Dawson 37 fumigant (30% ethylene dibromide, 70% methyl bromide), by direct application through meters from the tanks on a large, over-the-road tank trailer. This is believed by the firm which did the job, Ferguson Fumigants, Inc., to be the first fumigation in history performed in this manner with this type of fumigant. In the past, fumigants of this type have been available only in relatively small cylinders.

This giant bin presented a number of unique fumigation problems. The roof was held up by 15 lb. of air pressure per square inch. The pressure was constantly maintained by electrically operated fans. The bin could be entered only through an air lock. The bin was equipped with an excellent recirculation system, designed to operate while the air pressure was maintained inside the building. A degree of over-dosing was required to compensate for the continuous recirculation. Based upon all the facts available, the dosage was calculated at 11,000 lb. for the fumigation.

The 11,000-lb. dosage was applied from a single large truck tank containing 14,300 lb. of Dawson 37. The fumigant came out of the tank through two meters, to which 10 lines of tubing were attached. The tubing led into the bin, and was so placed as to distribute the gas evenly over the surface of the bin.

From there, the fumigant was pulled down through the grain by the aeration fans attached to the recirculation system; thus making a complete circuit with the gas. Utilizing this recirculation principle, the fumigant was moved through the grain mass several times, to assure even distribution.

Air Movement

Air movement through the grain was pre-determined by the use of a manometer.

Sample probes were then inserted in the areas showing the poorest circulation. From these probes, air samples were obtained, from which the gas content was determined by the use of a Fumiscope. This instrument indicates ounces per thousand cubic feet of the gas present at the point of sampling. While the gas was mov-

(Turn to GRAIN BIN, page 20A)

PURCHASES LAND

EVANSVILLE, IND. — Morris Grain Corp. has purchased a tract of land adjoining its property and fronting on the Ohio River to expand elevator facilities by about 600,000 bu. Present capacity is 800,000 bu. The land, less than an acre, was purchased from Mead Johnson & Co. The company also owns 20 acres of river frontage down-stream from Mt. Vernon, Ind., for possible future expansion.

New Home for Grain Treasures

BELTSVILLE, MD.—The World Collection of Small Grains, a genetic pool for grain breeders, is now located in a new laboratory at the U.S. Department of Agriculture's Agricultural Research Center, Beltsville, Md.

The collection, comprising old, new, foreign, domestic and experimental lines of wheat, barley, oats, rye, buckwheat and other grains, is now housed in its own building, where controlled temperature and humidity can better preserve viability of germplasm. It is hoped seed will last 10 years, instead of five, before replenishing is necessary. That's no small job when 30,000 different varieties are concerned.

The small-grains staff, in cooperation with state, federal and foreign experiment stations, collects and distributes working stocks of grain for evaluation and breeding. Seed is obtained from plant explorers, breeders, world expositions and exchanges with foreign governments. Over 91,000 seedlots were distributed in the U.S. and abroad in 1958.

In addition to the working stocks housed at Beltsville, well-documented material of all important breeding lines is being assigned to the National Seed Storage Laboratory at Fort Collins, Colo. Acceptance by the seed-storage laboratory insures against the loss of valuable germplasm from working collections, USDA states.

—BREAD IS THE STAFF OF LIFE—

GENERAL GRAIN BUSINESS

LINCOLN, NEB.—Farmers Elevator Co., Inc., has been granted a charter. A general grain merchandising business, Robert B. Berkley, Salina, has been named resident agent.

Wash Wheat?

ELIMINATE SEWAGE PROBLEMS with an IPI RECOVERY SYSTEM

Sewage problems—and costs—caused by wheat washing can be eliminated *profitably*, by installing an IPI Recovery System. The B.O.D. requirement of the washer-waste water is automatically and drastically reduced . . . and, you can reduce total sewage volume by as much as 90% if you wish.

RECOVERS EXTRA PROFITS...SAVES WATER

An IPI Recovery System adds to your profits by automatically recovering wheat-washer solids (a valuable feed supplement). It can also reduce city water requirements by as much as 90%. Your mill can enjoy these extra profits. Full information is available from—

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Claude J. Neville

John R. Hersey

Bartlett & Snow Co. Officers Are Elected

CLEVELAND — Claude J. Neville, formerly executive vice president and treasurer, has been elected president and general manager of C. O. Bartlett & Snow Co.

Other officers elected include: H. S. Hersey, formerly president and general manager, elected chairman of the board of directors; John R. Hersey, elected vice president and treasurer, and F. W. Neville, elected purchasing director and assistant secretary.

C. O. Bartlett continues as vice president and sales manager; B. A. Smith is vice president, secretary, and director of engineering, and H. A. Christy is vice president and director of manufacturing.

The company is a designer and builder of Triumph corn shellers, ear corn and small grain handling systems, rotary driers, coolers, calciners and kilns, and bulk material conveying, processing and screening equipment.

—BREAD IS THE STAFF OF LIFE—

St. Regis Reports Record Earnings, Sales in 1959

NEW YORK—The annual report of St. Regis Paper Co. and consolidated subsidiaries for the year ended Dec. 31, 1959, now going forward to stockholders, shows large gains in sales and earnings, establishing new records. Higher rates of production were recorded in practically every division.

Net sales for last year at $474,393,134, compared with $408.626,275 in 1958. Net income for 1959 at $28,615,519, was equal, after preferred dividends, to $3.01 per share of common stock, on 9,363,515 shares. This compared with $21,998,072, equal, after preferred dividends, to $2.41 on 8.941,118 shares in 1958. Of the $65,766,859 increase in sales, approximately 79% resulted from a strong improvement in business throughout the company. The balance represented the net sales of companies acquired in 1959 from the dates of their acquisitions.

Sales at the year end continued at a high level, and in practically all major divisions backlogs of unfilled orders were higher at the end of the year than at the beginning.

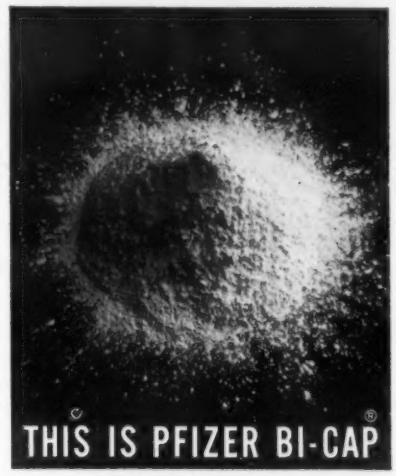
The consolidated financial results include the operations of Cornell Paperboard Products Co. for the full years of 1959 and 1958. Cornell joined St. Regis in December in a pooling of interests.

Cornell manufactures boxboard; folding, corrugated and solid fiber containers; wirebound wood veneer boxes and paper plates.

In 1959, St. Regis took significant steps in diversification and expansion. These were continuing moves in a long-range program that since 1953 has added approximately $195,000,000 of sales in entirely new fields and raised net sales from about $200,000,000 to over $474,000,000.

Latest Rulings in Labor Relations

MUST COMPANY PAY ALL EMPLOYEES THE SAME HOSPITALIZATION BENEFITS ?
WELCOME BACK FROM THE HOSPITAL, JIM!
YOU DIDN'T PAY ME ENOUGH BENEFITS!
WE HAVE RAISED BENEFITS FOR MANAGEMENT PEOPLE ONLY
YOU CAN'T DO THAT!
IT'S NOT FAIR TO PAY HIGHER BENEFITS TO OFFICE WORKERS!
WHY NOT ? UNION BENEFITS ARE LIMITED BY CONTRACT!
ARBITRATOR'S DECISION
NO, COMPANY DOES NOT HAVE TO GIVE UNION EMPLOYEES SAME BENEFITS AS NON-UNION
Based on a 1959 Connecticut Decision



THE ORIGINAL ENRICHMENT CONCENTRATE.

MILLERS HAVE USED IT WITH COMPLETE CONFIDENCE AND SATISFACTION FOR MANY YEARS.

TODAY, THIS TRADITIONALLY FINE PRODUCT —**NOW IMPROVED** AND **BETTER-THAN-EVER**— CONTINUES TO WIN NEW ACCEPTANCE.

Here are five reasons why many processors think first of Pfizer BI-CAP when they think of enrichment concentrates: **1. EVEN DISPERSION**—The uniform-size particles flow readily and smoothly. **2. EXCELLENT STABILITY**—All forms of BI-CAP are made with thiamine mononitrate for better Vitamin B_1 stability. **3. TWO STRENGTHS**—Single and double strength are available, for feeding to either a fast or slow flour stream. **4. UNIFORM BULK**—BI-CAP is milled to minimum variation. **5. LIGHT COLOR**—BI-CAP is formulated with a new type of riboflavin which gives it a lighter color and overcomes unsightly riboflavin agglomeration.

■ The BI-CAP line includes BI-CAP Bolted Cornmeal Enrichment, BI-CAP Whole Cornmeal Enrichment, BI-CAP Degerminated Cornmeal Enrichment, and BI-CAP Rice Enrichment. Write for full information about all Pfizer enrichment concentrates.

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BULK TESTING

(Continued from page 4A)

the atmosphere and did not draw out. As a result, these two loads developed an accumulation around the hatches and on the ends of the car.

Another concern was the effect ventilation would have on moisture content of the flour. It was only the top 1½ in. to 2 in. of the flour surface that was affected at all. In the majority of the trips, this top 2 in. changed from .15 to .30 of a per cent of moisture, plus or minus. In one instance where the humidity was in excess of 97% during the entire trip, the maximum moisture that the top 2 in. attracted was .5 of a percent. These slight surface adjustments in moisture seem to insulate the rest of the load and are unimportant in total effect on the flour load.

Results of Year's Research

As a result of all the reports and research of the past year, these are the results obtained:

(1) If the container can be kept dry inside during loading, the ventilating system will keep it dry in transit. If any moisture appears on walls or ceilings during loading, the ventilator will dry it out in a very few hours.

(2) Because the interior surface of the car has been kept dry, there has been practically no accumulation or caking occurring in the ventilated cars. There has been no offensive odor in any of the ladings, such as sourness or mustiness when the hatches are opened. As one bakery superintendent said: "There is always a dry fresh flour odor when you open the hatches on one of these ventilated cars."

(3) Throughout our entire research, not one speck of mold has developed on the walls, ceilings, hatches or surface of the flour.

(4) The cleaning time required, when returned to the mill, has been reduced from an average of 8 man hours to 2 man hours. Most cars were cleaned with a dry hand brush.

(5) The liners of the cars have remained in the same condition as they were when the ventilator was first installed. From our experience we believe that if the car was ventilated from its inception it would not require relining during the 10-year lease period.

(6) The ventilated cars without exception have drawn cleaner than other Airslides. As one bakery manager said, "This car empties best of any car I have seen at this plant."

The foregoing results have been so positive throughout all our research that we are convinced the ventilator system is the solution to most problems encountered in the bulk shipment of flour.

Limitations of Ventilation

It has been borne out repeatedly during our experiments that the ventilator system is completely dependent upon an adequate suction system on the car during loading. Most mills load flour pneumatically, and in so doing, are introducing additional problems in that the compressed air utilized is raised five to seven degrees by compression, and upon cooling, a certain amount of condensation occurs which adds moisture slightly to the lading. In order to remove as quickly as possible all the free moisture in the air used to load the car, there must be an adequate suction system to take it out immediately.

We have obtained the best results when a suction system is used that pulls from 2,500 to 3,000 cfm of air through the car during loading. If only one suction tube is used on one end and one breather on the opposite end of the car, the velocity is too great. By installing two suction tubes on the two hatches at one end and two breathers on the two hatches at the opposite end of the car we still were able to remove 2,500 to 3,000 cfm and were able to reduce the velocity by one half.

The flour delivery tube should be directed toward the breathers at all times so that the minimum amount of flour would be carried out by the suction system. This is the most effective suction system that we have been able to devise. However, it is not completely effective if the outside humidity is in excess of 85% to 90%. When the humidity is this high, it is almost impossible to keep a slight amount of moisture from forming on the ceiling of the car. When moisture does occur on the walls and ceiling, the flour turbulence from loading will settle and a slight film develop on the surfaces. The ventilator will dry this out quickly but will not eliminate the film that occurs during these exceptionally humid days.

Operating Procedures

The Filt-R-Aire has a ventilated hood at the top of each end of the car. The intake hood is equipped with a storm baffle to prevent the entrance of any foreign materials, snow, etc. (Figure I).

FIGURE I

Brake end of Airslide car showing the Intake Hood for Filt-R-Aire ventilator with storm baffle on underside of hood and locking rods on side of hood.

It is equipped with a dry permanent type aluminum filter. The exhaust hood on the opposite end of the

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☐ CLEANLINESS IN USE
☐ COMPACTNESS
☐ DURABILITY

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car has a 10-in. coaxial fan which pulls 550 cfm of air through the car continuously. (Figure II) Inside each of these vents are combination seals and air diverters which operate manually from the outside. (Figure III)

These diverters are controlled by locking rods which, when pulled out and locked in place, seal off the entire interior of the car during loading. After the car is loaded, the load must be trimmed so that the flour level is below the outlet and intake of the two ventilators. The suction which has been employed during loading should be continued for at least one half hour to remove any high moisture air being released from the flour load.

When preparing the car for shipment, the locking rods on each ventilator are pushed forward and locked in position, thus opening the vents and positioning them as diverters to circulate the air to the side walls of the car. The fan is then turned on and the hatches sealed and the car is ready for shipment.

The most important time for the Filt-R-Aire system are those hours immediately after the car is pulled away from the mill and sits on siding until made up into the train. During this time, hot moist air released from the load is constantly being expelled. When the car is put into the train, the generator charges the battery to replace the discharge which has occurred during idle time on siding. (Figure IV)

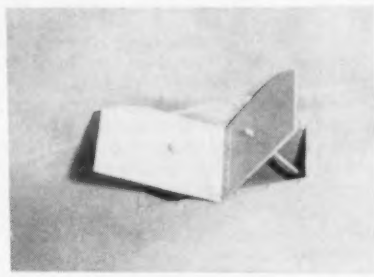
The generator reaches its full charge rate at 8.6 miles per hour. The fan draws 3 amps per hour and the generator furnishes 43 amps per hour at full charge. The nickle cadmium alkaline battery, with a 300 ampere hour capacity, will keep the fan operating for four and one half days on siding. (See Chart I)

It is also a complete cycling unit so

FIGURE II

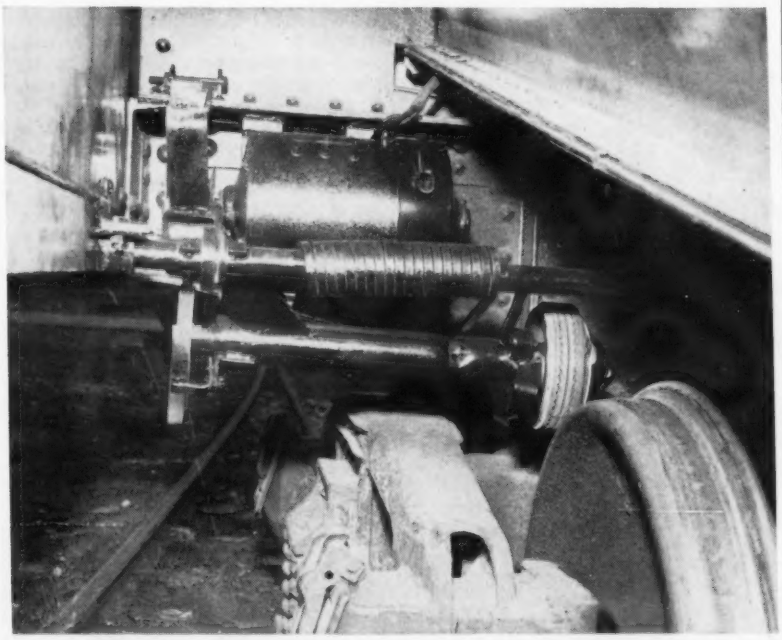
The "A" end of Airslide car, showing the exhaust hood of Filt-R-Aire ventilator which houses ventilating fan shown in upper center of picture. The regulator cabinet is located in lower center. The battery case is at the lower right.

FIGURE III



Interior of Airslide car, showing combination seals and diverters in open position as air diverters. The rods controlling the diverters are operated from outside the car.

FIGURE IV



Beneath Airslide car, showing generator with Preco Drive, which is friction powered from rubber-tired wheel running on rim of car wheel.

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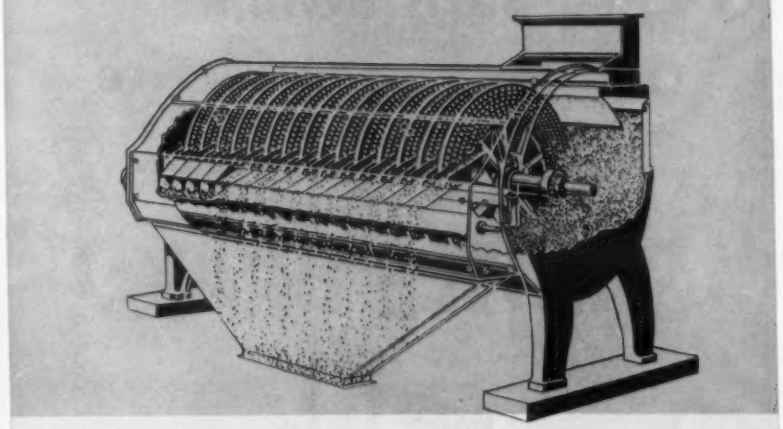
GRAINS DIFFER IN LENGTH

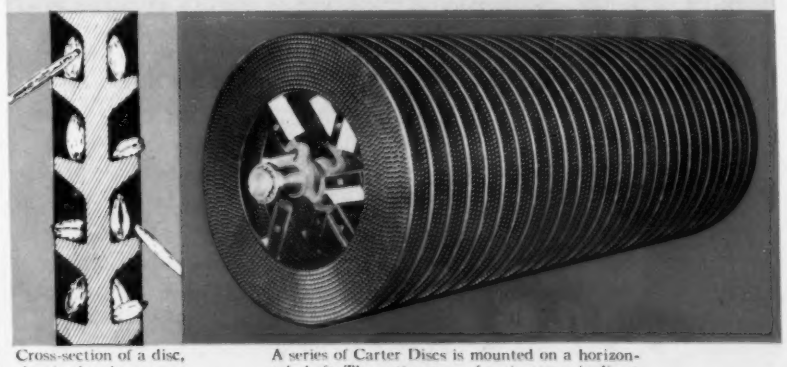
CARTER DISCS SEPARATE BY LENGTH

YOU CAN MAKE EXACT LENGTH SEPARATIONS WITH

CARTER DISC SEPARATORS



Many grains are almost identical in width or thickness and would be difficult to separate if it were not for differences in their *length*. Carter Discs contain hundreds of pockets that select or reject grain or seeds according to length . . . and assure *exact* separations.



Cross-section of a disc, showing how longer material is rejected.

A series of Carter Discs is mounted on a horizontal shaft. The entire mass of grain comes in direct contact with these discs.

SC

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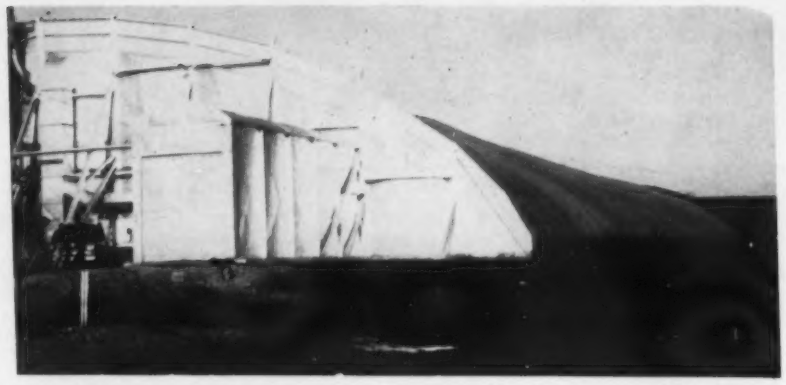
that, if completely discharged, it will again take a full charge, and there is no danger of freezing while discharged, as the specific gravity does not change in this type of battery.

When the car reaches the bakery, the fan should be turned off immediately. The locking rods on the vents should be pulled out and locked again in position, sealing off the interior of the car. After the car has been unloaded and is ready to be returned to the mill, the hatches are sealed and the locking rods again are pushed in and locked, opening the vents on each end. The fan is then turned on for the return trip, if required. We have found that the fan is not required on the return trip if the outside humidity is not too high or if the return trip does not route the car into entirely different climatic conditions. If either of these instances exists, it is recommended that the fan be used on the return trip also to keep the interior of the car dry.

The research and development department of F. H. Peavey & Co. is now offering to furnish and install Filt-R-Aire units on all Airslide cars, either owned by the railroads or leased by companies from General American Transportation Corp.



This is the large, flat-storage grain bin fumigated with Dawson 37. The roof of the bin is supported by 15 pounds of air pressure to the square inch. The bin can be entered only through an air lock.

GRAIN BIN

(Continued from page 16A)

ing into the bin, a constant pressure was maintained on the truck tank by an air compressor that supplied air into the tank through a chemical air dryer.

The large tank trailer used in the fumigation is a dual-purpose outfit. The tank was originally built to transport the fumigant in bulk to strategically located storage tanks. From there it is transferred to small automobile trailers for the fumigation of smaller bins, by a similar method. However automobile trailer units are too small for bins of this size. Though still used for transportation purposes, the large tank trailer has been proven to be well adapted to the large scale direct metered bin fumigation.

—BREAD IS THE STAFF OF LIFE—

MORE STRONTIUM-90

OTTAWA—The level of strontium-90 in Canadian milk samples rose slightly in December but was still below the peak reached in June last year, the health minister announced here. The monthly average of strontium-90 ratings reached a high in June of 21.3 micro-microcurries per gram of calcium. The December, 1959, figure was 15.5.

Swiss Firm Discovers 'Beauty from Bran'

NEW YORK—In order to beautify her skin, Cleopatra used to take baths of asses' milk. Modern cosmetical science has imagined some more accessible means, in order to place esthetic care at the reach of everyone.

Nevertheless, some of the good old-fashioned recipes were excellent; for instance, in the case of bran baths which formerly were in favor for the care of the skin.

A Swiss firm which, for the last 50 years has specialized in the manufacture of products for bath-therapy, has succeeded, after experimenting over a number of years, in extracting from the bran and the seed of cereal grain which accompanies it, all the active elements, that is to say the vegetable hormones (the use of which does not offer any danger), the vitamins and other substances which exercise a salutary effect on the skin, more particularly by stimulating cutaneous circulation and respiration.

It has proved possible to manufacture soluble granules for the bath, which replace ordinary bran and exercise a far greater effect on the skin, as well as a cream and a lotion which soften and cleanse the skin, and this without the addition of any chemical product. These three new products, which are absolutely original and are suitable for everyone, for old people as well as for babies, have already received a very favorable welcome both in Switzerland and abroad.

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FLEX-A-FOAM
DUST MASK
(no other product like it . . . anywhere)

Here's everything that management and worker alike could possibly want in a dust respirator!

1. Form-fitting design: Self-adjusting to any size and shape of face without pressure or irritating discomfort.
2. Attractive styling: Smartly designed to suit the most discriminating wearer.
3. Filtering efficiency: Filters non-toxic dusts 100 times smaller than the eye can see.
4. Easy-breathing comfort: Easier to breathe through and talk through than an ordinary pocket handkerchief.
5. Feather-like weight: Weighs only 1 ounce complete.
6. Simplicity and economy: Only 4 tough, long-wearing inter-locking parts — all washable. Pure latex filter outwears throw-away type more than 100 to 1.

No wonder FLEX-A-FOAM is the one dust respirator workers welcome and WEAR!

Sample only $1.45 postpaid (Industrial price only)

FLEX-A-FOAM DUST MASK

FLEXO PRODUCTS, INC. • Westlake, Ohio

Modernized Mill in Georgia Uses Flour Packer for Dual Operation

Southeastern Mills, Inc., Rome, Ga., has taken a giant's stride forward to modernize its plant operations, not only for improved production, but also to provide better quality products and services to its customers. The firm has completed a new structural addition to house the administrative offices of its plants, storage bins, air veying and—of high importance—its packing equipment.

One of the key installations made during Southeastern's modernization has been a Richardson flour packer made to serve a dual purpose. Basically, the same equipment is used both for packing and bulk loading, an operation highly pleasing to Fred Stivers, superintendent.

A Richardson Scale Co. Model GGG-38/G-23 automatic scale and pneumatic packer combination machine is used (1) for packing of flour into 50 lb., 100 lb. and 140 lb. open-mouth paper or textile bags. One man is used to pack and sew at a rate of 240 100-lb. bags an hour, and (2) to load bulk flour trucks.

In the bulk loading operation, the same packer is able to pack vehicles at a rate of 300 cwt. an hour. This is done by attaching a metal spout, by means of a flexible connection, to the packing auger of the flour packer. Scale controls are selected to bulk load, and the machine automatically weighs and discharges flour. The flour, in turn, is conveyed through the transition spout to an air veying system directly under the floor to the bulk loading station.

Because the same equipment is used for packing and bulk loading, Mr. Stivers is particularly enthusiastic about the arrangement. He states that changeover from either bags to bulk or the reverse is accomplished very easily in about 5 min.

Complete Line

The mill produces, in addition to bakery flour, a complete line of family flours, and is also noted for its corn meals. It presently operates two bulk flour trucks, and also facilities for loading bulk rail cars with bakery flours.

The blending and packing system consists of 12 metal storage bins, with a capacity of 700 cwt. flour each. Bins are filled by means of an air veying system, and are discharged by an air slide, to a variable speed feeder, which then feeds the flour into an air line for conveying, through a sifter and an Entoleter, to the packing and loading bins.

Blending of flour is accomplished by means of an electronic control panel, designed and supplied by Richardson Scale, whereby any of the feeders under the 12 flour bins can be selected to operate, thus permitting the desired blend.

The Richardson control center automatically starts, at the same time, all bin feeders selected. The control panel is also designed to stop

—BREAD IS THE STAFF OF LIFE—

Ehrsam Appoints Harvey Shank to Management Post

SAN FRANCISCO—Harvey Shank has been appointed manager of Ehrsam Pacific in San Francisco, West Coast subsidiary of the J. B. Ehrsam & Sons Mfg. Co. In this capacity, Mr. Shank will be responsible for sales of the full line of Ehrsam material handling equipment in the states of California, Washington, Oregon, Nevada, Idaho and western Montana.

Mr. Shank has over 20 years experience in sales and engineering of material handling equipment for the grain and feed industries, among others. Most of this experience has been in the West Coast area.

The former manager of Ehrsam Pacific, William C. Thomas, has been transferred to Atlanta, Ga., where he will assume duties as southeastern district manager for Ehrsam. In this capacity Mr. Thomas will be responsible for sales in the states of Georgia, Kentucky, West Virginia, North Carolina, South Carolina, Mississippi, Alabama and Florida.

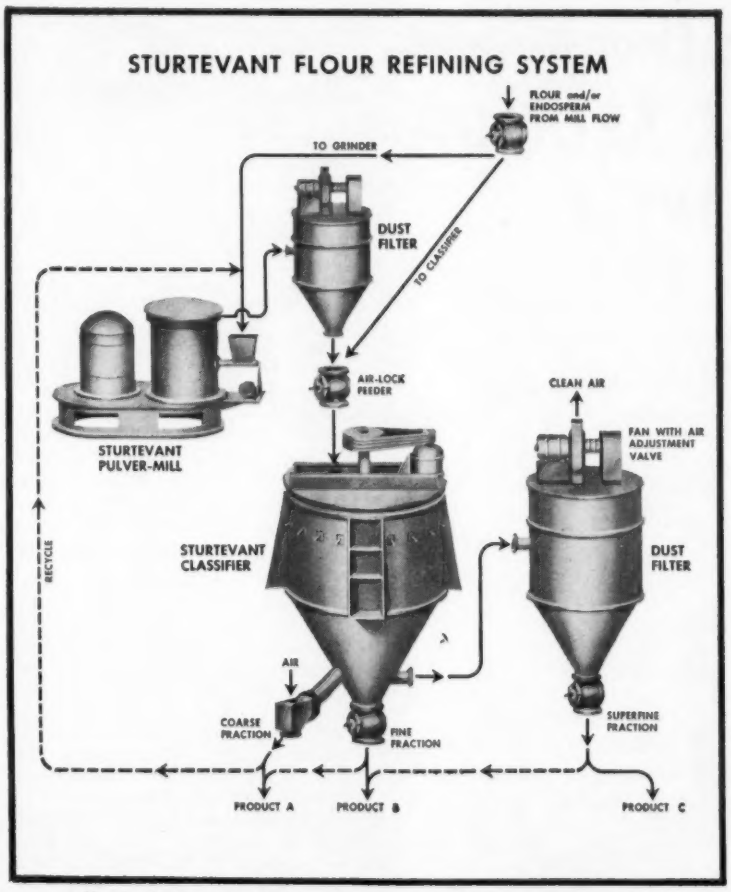
• • •

Named District Manager

DENVER—Leon Lambert has joined the J. B. Ehrsam & Sons Mfg. Co. of Enterprise, Kansas, in the capacity of Colorado district manager. Headquartering in Denver, he will be responsible for sales of the full line of Ehrsam materials handling products.

An alumnus of Drexel Institute, Mr. Lambert has over 13 years experience in heavy industrial sales and engineering of materials handling systems and equipment.

New Sturtevant Flour Refining System is Highly Flexible, Makes Precise Separations



Key to the Sturtevant Refining System shown above is a Sturtevant Air Classifier which can produce 3 kinds of flour in one operation. Both the Pulver-Mill and the Air Classifier have exceptionally large capacities.

For protein shifts... Primary classifications.. Coarse or fine separations for new end products

Sturtevant's new flour refining system is the result of 44 years of experience engineering classification systems for food and other industries.

Heart of the special system is a Sturtevant Air Classifier which classifies coarse, fine and superfine fractions. Low volume of air requirements means smaller dust filters. Thus savings in both space and costs are effected.

The Classifier makes precise selections of end products by means of exact control of air currents and centrifugal force. Simple adjustments in counter action between these two forces permit the receipt of almost any desired particle size.

Operation of Sturtevant's new flour refining system is highly flexible. The Pulver-Mill and Air Classifier can be used singly or together, in accordance with individual grinding-classifying needs.

CALL ON STURTEVANT to help you upgrade your milling system while lowering production costs. Sturtevant Flour Refining Systems offer much higher output capacities than are available elsewhere, yet require only ⅓ as much capital investment.

Write today describing your requirements. A Sturtevant engineer will be happy to make recommendations based on 44 years' successful experience with grinding-classifying problems. Address your letter to *Grain Processing Division, Sturtevant Mill Company, First National Bank Bldg., Fostoria, Ohio.*

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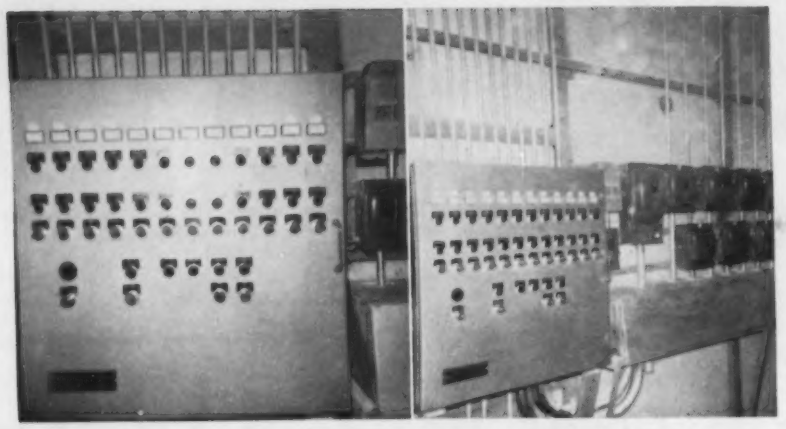
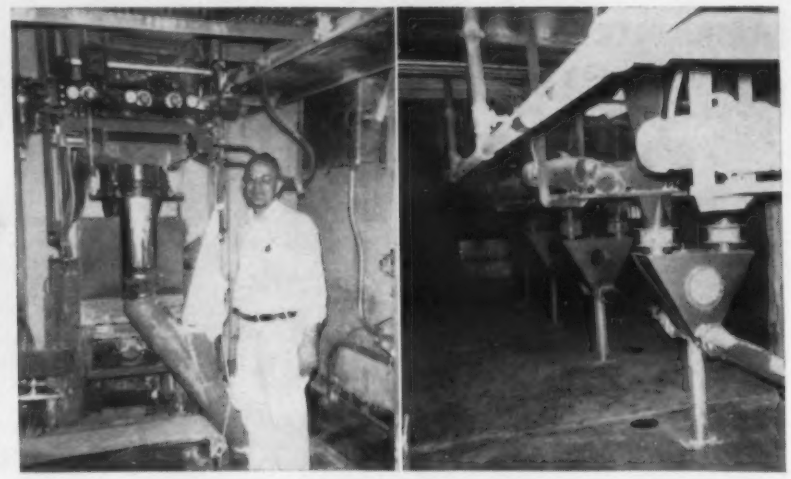


CONTROLS—At the left is a close-up view of the Richardson Scale Co. control panel for the blending system at Southeastern Mills, Inc. At the right is the motor starter control panel from an angle which shows the wiring and conduit system through which blending is controlled.



BULK LOADING, BLENDING—At the left is a view of the Richardson flour packer at Southeastern Mills, Inc., showing Fred Stivers, superintendent, standing next to the attached bulk loading tube. At the right is a view of the blending bins, showing the bin feeders and the air-veying line beneath the bins.

all feeders, selected, should the flour in any of these bins drop below the low level supply point, as indicated by bin level switches.

Provisions are also included for bin clean out, and the control panel is properly interlocked so that the bin feeders will not operate unless all equipment in the blending system, such as air pumps, sifters, etc., are also operating. Failure of any of this equipment also will automatically stop the flour bin feeders.

Management

The present management of Southeastern Mills, consisting of Fred Johnson, president; J. B. Gordon, vice president; W. H. Austin, secretary-treasurer, and Mr. Stivers, superintendent, assumed operation of the mill in 1940. Since that time production has been increased to the present capacity of 1,500 cwt. per 24 hr. for flour and 1,000 cwt. for corn meal.

Storage capacities for grain amount to 450,000 bu.; plus also storage capacity for 10,000 cwt. flour.

——BREAD IS THE STAFF OF LIFE——

NETHERLANDS' GRAIN PRICES

CALGARY, ALBERTA—The fixed price for wheat and guaranteed floor prices for home-grown feed grains in 1960 have been set in the Netherlands, reports the Wheat Pool Budget. The new prices, all slightly above the 1959 level, are approximately as follows in terms of Canadian dollars: Wheat $2.13, rye $1.77, oats 94¢ and barley $1.48. No restrictions are placed on wheat imports, but to assure farmers of a fair return for domestic sales of feed grains a tax will be levied on feed grain to equalize the difference between the domestic floor price and the cost of imports.

RECORD WHEAT HARVEST?

WINNIPEG — India's wheat harvest, which was started in March, is expected to set a new record. Seeding took place under very favorable conditions and an organized official campaign to help farmers get improved seed and the right kind of fertilizer contributed to the promising outlook. Weather conditions have been favorable in most areas except in some northwest districts where drouth is lowering crop prospects.

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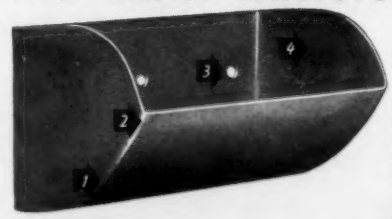

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Cover of the pilot issue of the new Northwestern MILLER provides a new "wrapping" for a new editorial concept, including many new features and departments.

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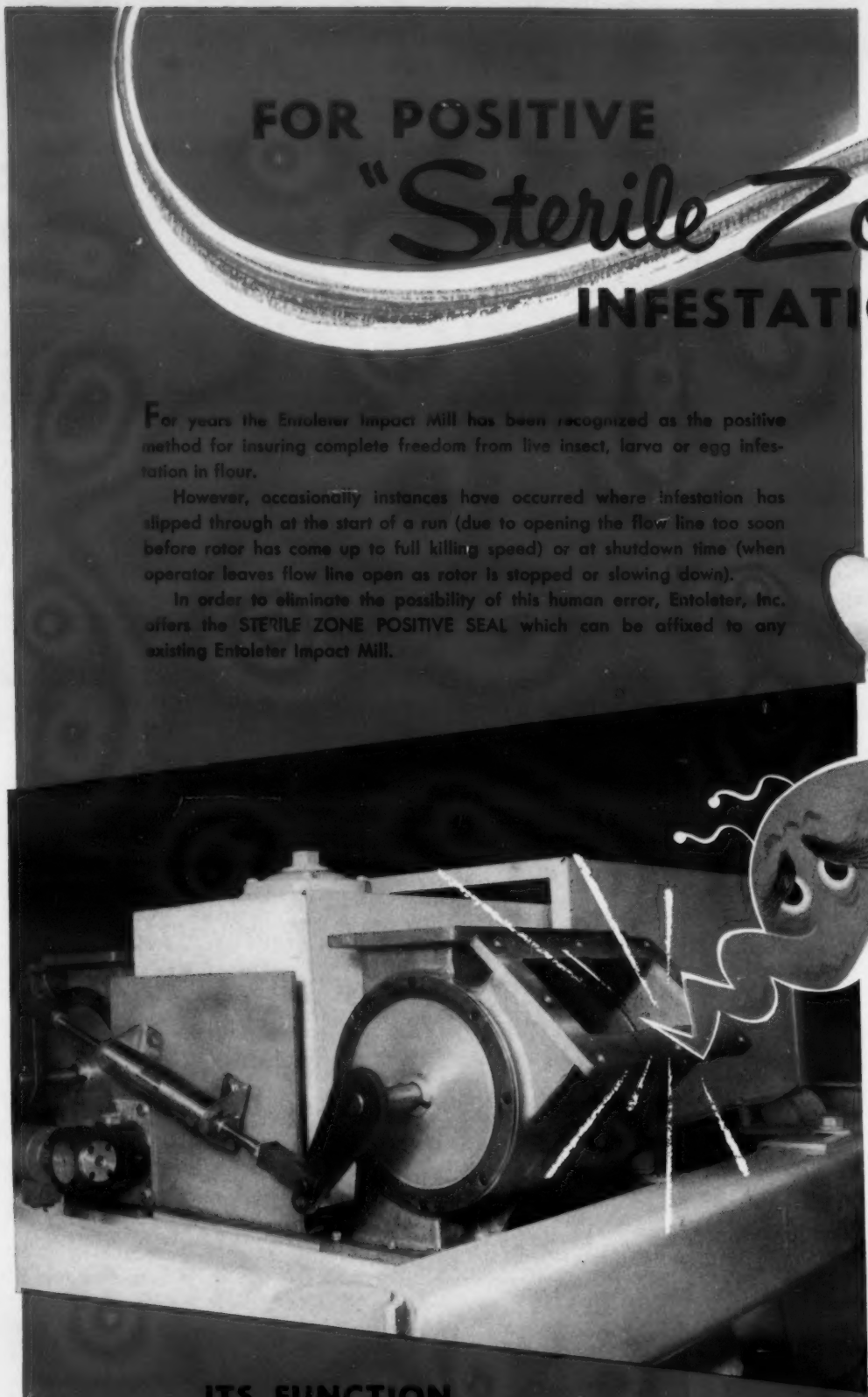

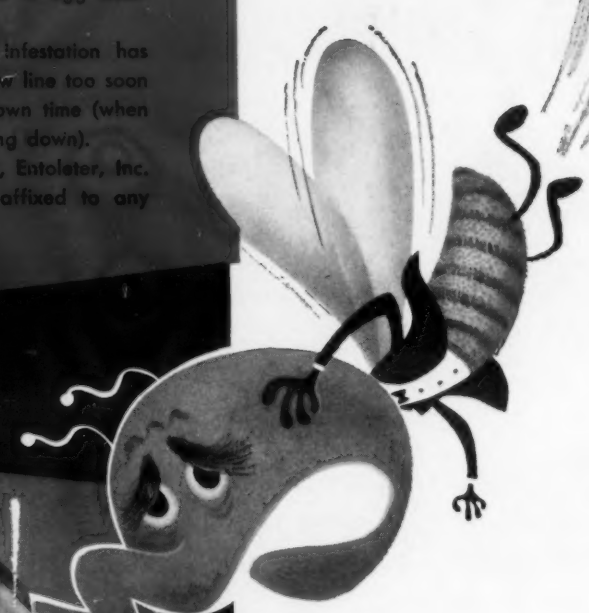

ITS FUNCTION

The STERILE ZONE POSITIVE SEAL automatically opens the flow line at the machine only when rotor speed reaches 100% efficiency and closes the line completely before the rotor speed is reduced below this point. This foolproof control eliminates any possibility of contamination of the STERILE ZONE product.

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